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Illinois
Business

Review

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The Outlook for Interest Rates

Interest rates are likely to continue to decline for the near-term future, although the decline will not be without interruption. More important, over the longer run there is a good chance of a break in the general upward movement in rates that has characterized the past three decades.

The interest rate forecast is spelled out fully in the next section of this article. Following that, there is a general discussion of the errors inherent in forecasts of this sort, even in the unlikely event that they turn out to be reasonably accurate.

Future Changes in Interest Rates

Interest rates have declined sharply since mid-1984 and have fallen more than 8 full percentage points from the levels reached in late 1981. On average, interest rates have declined 37 basis points per month during the most recent period of decline. There are at least two important questions relating to future interest rate developments. One is concerned with interest rate changes in the near-term future, but the more important question deals with interest rate trends over the long run.

What about the near-term future? As a short-hand way of talking about interest rate developments, it is useful to regard the level of nominal interest rates as the sum of a so-called "real" rate and an inflation premium. By adjusting for expectations regarding future rates of inflation, the inflation premium serves to keep rates of return on debt appropriately related to returns on real assets.

Expectations are not observable, but they may reflect an accumulation of evidence relating to inflation experience. In addition, there are those who may be gifted at interpreting recent or current economic policies, or in forming insights regarding future policies. Moreover, there may be analysts who understand the effects of policy variables on the future course of events. To the extent that there can be informed predictions, these too can be brought to bear on inflationary expectations. But such insights are beyond the scope of this article.

An extrapolation of inflationary experience over the past several years suggests that the inflation premium is about 4 percent. Research evidence relating to the real rate indicates that it varies between 2 and 4 percent. In simple-minded fashion, a matrix of possibilities has been specified within which to talk about prospective developments during the next six months or so (see the Table). However, each of the outcomes in the matrix are not equally plausible. Thus, for example, it is implausible to believe that the real rate will move to 4 percent in the next year or so. Similarly, it is implausible to suppose that the inflation premium will fall to 2 percent. Thus, within the framework of this mechanistic view, interest rates (as measured by yields on one-year US Treasury securities) in the next 6 to 12 months will be bounded between 6 and 9 percent. At this writing, yields on one-year Treasury securities were fluctuating near the 7.5 percent level—fluctuating upward.

Table. Future Nominal Interest Rates

	Range of Movement in the Real Rate:		
	2%	3%	4%
Range of Movement in Inflation Premium	Nominal Interest Rates		
2%	4	5	6
4%	6	7	8
6%	8	9	10

The view presented here is that interest rates will move generally downward by as much as 50 basis points. Such a movement would take yields on US Treasury securities to 7 percent. Even if this view is reasonably correct, it is important to superimpose a set of random fluctuations similar to those appearing around the fitted lines on the Chart (discussed later). Hence, interest rates can show rather large, temporary movements. The purpose of this reminder is to give courage to the faint-hearted, to those who might be misled by very short-term, self-reversing fluctuations.

But what about the long run? Interest rates have moved upward in stair-step fashion over the past 25 years. In each successive five-year period, interest rates were higher than in the preceding five-year period. Has that movement ended? It borders on foolishness to suppose that meaningful conclusions about the long run can be made on the basis of experience of a few years. But it is necessary to cross that border at this time. The view presented here is that the long-run upward movement in interest rates has been blunted.

The cornerstone to such a view rests on the important association between the decline in interest rates and the decline in rates of inflation. The decline in interest rates did not result from an expansive monetary policy. Instead, interest rate reductions are simple reflections of a decline in the inflation premium.

Why did rates of inflation decline? The most common explanation has several components. One aspect of the explanation rests on the observation that the economy has been weak for an extended period of time. The economy limped through 1979, sagged badly during 1980, rebounded weakly into mid-1981, then moved into a prolonged recession from the late summer of 1981 through late 1982. As a consequence of approximately four years of weakness, excess demand was wrung from the economy and institutional biases toward rapid price increases were altered. Labor concessions in wage bargains, unheard of for 40 years, became a factor in labor negotiations. Against that background, the subsequent economic expansion, now nearly three years in duration, has not moved into a period of accelerated price increases.

Another aspect of the usual explanation for the moderation in price increases relates to the intense competition of foreign goods. With high-quality foreign goods flowing into the United States, domestic producers have been limited in their ability to raise prices. In addition, and partly as a consequence, the economic expansion has been accompanied by increases in productivity.

But does that mean that inflation will be renewed as soon as these special factors lose their force? Perhaps. But it is my view that since price stability is not unusual, it requires very little explanation. Instead, the part of our economic past that is unusual is the accelerated inflation of the second half of the 1960s and the 1970s. Barring a return of the factors leading to accelerated inflation—war, major disturbances in raw materials sources, along with a large jump in characteristic monetary growth rates—there is a reasonable presumption that the economy will be substantially free of rapid inflationary run-ups.

What this means is that the long-term upward movement in interest rates is halted. It is possible to achieve further interest rate declines over the long-run. Future interest rate declines depend upon further reductions in the core rate of inflation.

Limitations of Interest Rate Forecasts

Forecasts of future movements in, or the levels of, interest rates, such as that presented above, are quite common. But the task is uncommonly difficult, in the sense that useful forecasts are infrequent. There is, as well, likely to be considerable error, even in forecasts that, after the fact, may be regarded as generally accurate. Moreover, what is unknown can be critically important.

In what follows, I give some idea of the magnitude of error consistent with reasonable understanding. This discussion is carried on within the context of time-series analysis.

Time-Series Analysis

One approach to the analysis of an economic time series is to decompose it into its constituent elements. It is common to imagine that an economic time series—such as industrial output, retail sales, employment, and so forth—is affected by secular, cyclical, seasonal, irregular, and random factors. Secular forces relate to those factors that have exerted a persistent influence over an extended period of time, perhaps as long as 20 or 30 years or longer. Cyclical forces are those associated with what is frequently referred to as the business cycle. Such forces may last several years, depending upon the duration of the cycle. Seasonal forces are those that register a yearly, or shorter, periodicity. Irregular forces refer to explainable episodes without definable periodicity—such as strikes, natural disaster, political decisions, and so on. Random factors relate to unexplainable variation, presumably both positive and negative shocks.

There is a widely held view that interest rates show no seasonal periodicity. That view is not challenged here. Nor do I make any effort to differentiate between irregular and random changes. In what follows, I limit attention to secular and cyclical factors.

Secular Changes in Interest Rates

Using monthly yields on one-year US Treasury securities of constant maturity, a trend line was fitted through interest rates for January 1959 to June 1985. Results show that, on average, interest rates rose about 3 basis points (three-hundredths of one percent) per month during the period. There is a view that the upward trend resulted from successive revisions in expectations regarding inflation.

It could have been very useful for a small number of people to have possessed that information at the beginning of, or early on during the 26-year period. If such knowledge had been in the hands of would-be borrowers, it would have increased their demands for borrowed funds. In contrast, if such knowledge had been in the hands of long-term lenders, they could have gone out of business. Of course, if everyone had "known," actual experience would have taken a different path.

The typical, or standard, deviation in monthly interest rates on one-year Treasury securities during the period was 324 basis points. Even after fitting the trend line through the data, substantial variation remained. The variation around the trend line averaged 181 basis points, and the range of error (from high to low) was 1,027 basis points. Measured in terms of forecasted values, the error averaged more than 26 percent.

In short, even if an individual business or household had held an accurate view of long-term trends, it would have found itself ill-prepared for many short- to intermediate-term decisions.

Cyclical Changes in Interest Rates

There were 11 contrasting periods of cyclical change during the 318 months from 1959 to 1985. As it turns out, there were more periods of rising interest rates than periods when interest rates were falling. Moreover, the periods of rising rates were much longer than the periods of declining rates. Interest rates generally drifted upward for about three-fourths of the time.

Suppose we had been able to differentiate between these cyclical episodes. The Chart presents the interest rate data with lines filled through periods of rising and falling interest rates. (The time periods were identified by visual inspection, and the trends were fitted by least-squares techniques.) During periods when interest rates were rising, the average monthly increases ranged from 18 basis points to less than 1 basis point. By comparison, during periods when interest rates were falling, the average monthly declines ranged from more than 40 basis points to just over 7 basis points.

If the cyclical episodes represented by the fitted lines constituted the state of knowledge, there would have been a substantial reduction in unexplained interest rate movement. The deviation around these cyclical trend lines averaged 79 basis points.

Concluding Remarks

The short-term interest rate forecast presented in the first section is essentially a prediction that dominant forces will not change. Instead, there will be a continuation in the downward movement in interest rates that began in late 1981. But the movement will not continue for much longer. The longer-run interest rate forecast is a prediction of change. It rests on the view that there have been important shifts in the economy.

The second major section of the article warns that even if the principal forecasts are correct, there is substantial remaining fluctuation. I have made no attempt to predict very short-term, reversible fluctuations. ●

Interest

'71   '73   '75   '77   '79   '81   '83   '85
Year

Interest

'58   '60   '62   '64   '66   '68   '70   '72
Year

5

LEONARD F. HEUMANN
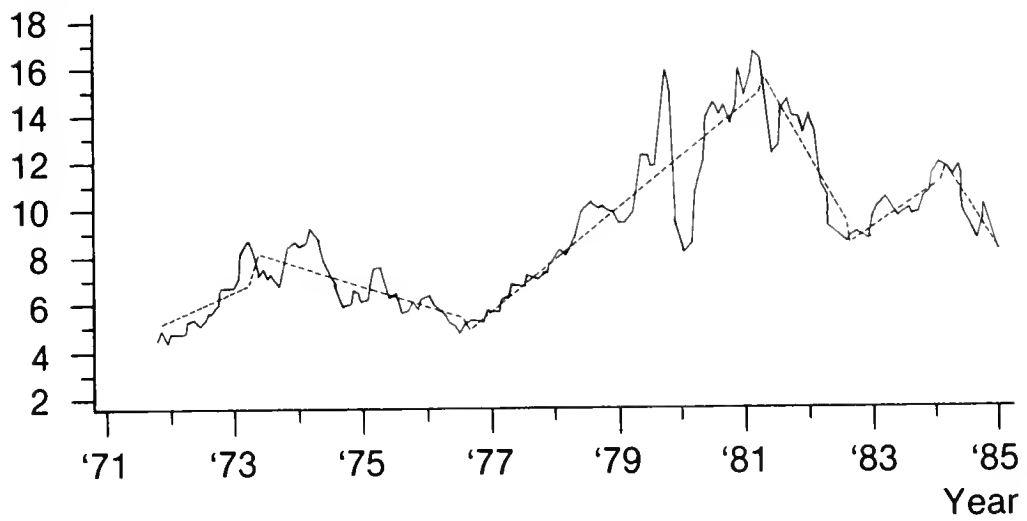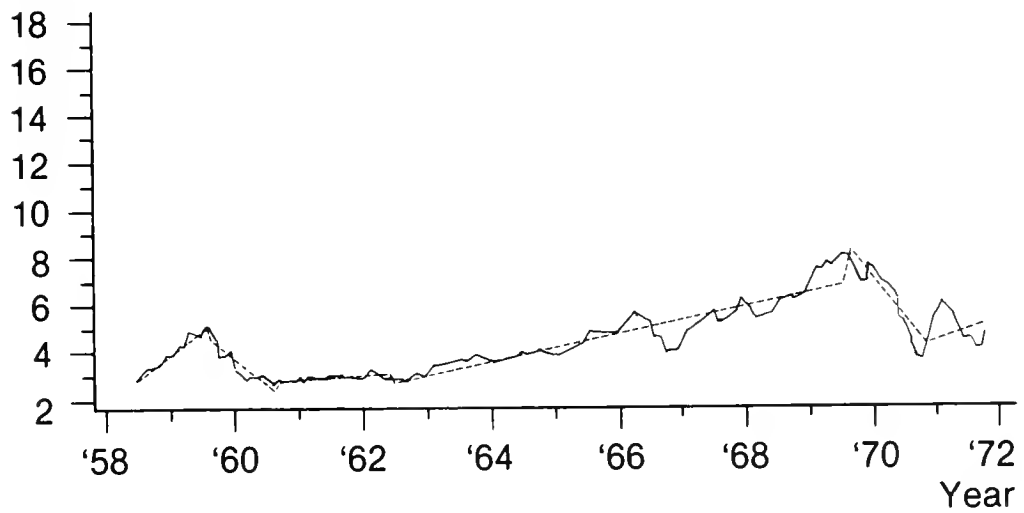
Illinois Housing: An Analysis of Changing Conditions and Needs

A housing needs analysis is a means of identifying the number and percentage of housing units that are substandard or overcrowded, those households that cannot afford decent, safe, and affordable housing on the private market, and the changes in household demographics and housing conditions over time that can aid in the development of future housing policy and program design. This article reports on such a housing needs analysis for Illinois, conducted in 1984 for the Illinois Housing Development Authority. The full report analyzed over 14 different data sources, for 144 separate areas of the state and employed over 500 variables. The analysis relied on secondary data with primary emphasis on the US Census. While the results provide one of the most comprehensive pictures of housing needs in Illinois history, there are still severe limitations to the use of secondary data. All the measures of housing need used have limitations. Nevertheless, some clear trends and planning implications emerge. This article will deal primarily with state-wide data and not the 143 areas of the state analyzed in the larger study.

The findings will be divided into three major sections: important housing-related economic and demographic trends; inadequate housing; and housing needs resulting from excessive housing costs.

Demographic and Economic Characteristics

Population Characteristics

Net outmigration was the single most important population trend in Illinois between 1970 and 1980; its character has important long-range implications for housing needs and program priorities. Population increased 2.8 percent to 11.41 million residents during the decade, less than one-fourth the national growth rate and one-third the state rate over the previous 40 years. This is due to the outmigration of 380,687 persons, a rate of 3.4 percent.

Economic Conditions

As a predominantly industrial state, Illinois was hard hit by the recession of 1980–1982. The average unemployment in 1979 was 5.5 percent, rising to 11.4 percent in 1983. During the subsequent recovery, overall unemployment dropped to less than 10 percent by April 1984, but that was exceeded substantially in many rural areas and older, industrial cities. The state's labor force grew by 18 percent in the 1970s, as a result of "baby boom" children entering the workforce for the first time and to the increased participation of women. Were it not for the outmigration of active workers, the unemployment figures would probably be much higher.

Household Characteristics

The most dramatic shifts occurred in household statistics. While husband-wife households constitute 60 percent of the total, their number decreased by 2 percent in the 1970s compared with a national increase of 10 percent—suggesting an especially high proportion of young adults delaying marriage or an outmigration of families. One-person households increased by 49.5 percent and two- and three-person households increased by 1.2 percent, while four- and five-person households declined 6.6 percent and larger households declined 32.5 percent. The average number of persons per household declined from 3.09 in 1970 to 2.76 persons by 1980. If the trend in smaller households continues, one strategy may be to build smaller, more efficient houses for small households.

Elderly Households

These grew substantially during the 1970s. Illinois was one of only seven states with more than one million persons over 65 (1,259,296) in 1980. Statewide, 20.5 percent of all units were occupied by a householder aged 65 or older, while in many counties the figure ranged as high as 25 to 33 percent. Their numbers will continue to increase, especially the "old old," aged 75 and older, a group that will double in this quarter century. New solutions will be required to cope with the needs of this group because of its health problems, the survival gap between spouses and a decreasing pool of children to support elderly parents. One strategy calls for congregate-care facilities—private apartments with congregate dining, housekeeping, and social services—to bridge the gap between traditional housing for the independent elderly and nursing homes.

Female-headed Families

A dramatic 34.7 percent increase in the number of female-headed families occurred in the 1970s, bringing the number of such households with children under 18 and no husband present to 429,143 or 14.6 percent of the state's households. Most resided in Chicago (44.8 percent) and the larger urban centers. Of those families, 30.8 percent were below the poverty line and comprised 48.7 percent of all families in poverty. They require safe, affordable housing but are frequently victims of discrimination and are unable to devote adequate time to their housing search; they require day care, social services, and the assistance of governmental transfer payments.

Rural Net Immigration

Despite the state's net outmigration, there was net immigration in five suburban SMSA counties, due essentially to the growing employment base in newer municipalities surrounding Chicago and to the housing demand of young families that are economically upwardly mobile, many buying their first home. There was also significant growth in non-SMSA rural counties in the 1970s. This was a new phenomenon that was reported nationwide. It occurred mainly in the southern counties of Illinois and occurred without any economic growth serving as a catalyst, since unemployment remained high in these counties. This may be retirement-age households returning to rural areas they left years ago and urban retirees seeking environmental amenities in affordable retirement locations. According to recent national statistics, this phenomenon has ended. However, there still may be pockets of fast-growing rural townships in Illinois with very attractive environments, close to interstate highways, that provide more land and housing amenities per dollar than urban areas, especially for lower income retirees.

The Dwindling Housing Supply

One way to measure the state of the housing stock is the percent of vacant standard units. A vacancy rate of 2–3 percent for owner-occupied housing and 5–8 percent for rental housing provides adequate choice and mobility while retaining an adequate sales price and rent structure. In 1980 the vacancy rates were 1.8 and 7.5 percent, respectively, in Illinois. However, the market tightened dramatically in the next three years. In Chicago, for example, the owner vacancy rate was 1.8 percent in 1980 and 0.6 percent in 1983; rental vacancy rates were 6.7 percent in 1980, dropping to 1.1 percent in 1983.

Chicago also reflects the changes in housing tenure throughout the state resulting in decline of rental units. Rental units in Chicago declined absolutely in the 1970s by 73,300 units or 6.4 percent. Condominium conversions during the decade increased by 57,400 units or 280 percent. By 1980 condominiums accounted for 5.3 percent of the occupied housing stock in Chicago.

There were only 176,679 subsidized housing units or 4.4 percent of the total stock in the state at the end of 1983, while 11.3 percent of the state's households had incomes below the poverty level. Despite the fact that Chicago had 44.2 percent of all the subsidized units, only 6.6 percent of all the city's housing was subsidized at the end of 1983, and most of that was built prior to 1981 with few additions since.

Rising Poverty Levels

In 1980, 40.6 percent of the state's population had low to moderate incomes (below 80 percent of the median)—a relative increase of 9.9 percent over 1970. Of those, 25.5 percent had low incomes (below 50 percent of the median)—a relative increase of 27.9 percent. Far more renter households (21 percent) were at or below the poverty line in 1980 compared to homeowners (5.8 percent).

Persons under age 65 were hurt most during the '70s. By 1980, 20.7 percent of the nonelderly were in poverty, an increase of 53.5 percent over 1970. Although the elderly made some income gains due to increased eligibility and participation in pensions, social security, and housing subsidies, 15 percent of this rapidly growing population were still in poverty.

Inadequate Housing

There are two broad classes of housing need, one resulting from inadequate housing requiring rehabilitation or removal of the unit and relocation of residents to adequate housing, the second overly costly housing. Inadequate housing from a health and safety standpoint can result from overcrowded living conditions, substandard shelter, or substandard surrounding environment.

Overcrowding

This traditional housing need indicator is rapidly becoming a nonissue, especially in smaller cities and non-SMSA counties. This is due to outmigration and decreasing household size, as more younger persons and the elderly live alone and younger families have fewer children. In 1980 there were 158,366 households in which occupancy exceeded 1.01 persons per room, a decline of 107,088 for the decade. Among rental units, crowding declined 32.9 percent in the 1970s, from 9.2 percent to 6.2 percent. Among owner-occupied units the decline was 60.4 percent, from 6.5 percent to 2.6 percent. Almost 53 percent of all overcrowded households were in the city of Chicago, and 90 percent in the 29 largest municipalities. Even in Chicago, crowding occurred in only 9.2 percent of the rental units and 5.3 percent of the owned units.

Substandard Housing

Since 1970, the US Census has relied on the residents of each housing unit to report on their housing conditions as opposed to the use of trained enumerators. Residents cannot evaluate the condition of a structure and its contents so the census has had to rely on surrogate measures that the lay public can report accurately. These are lack of some or all plumbing for exclusive use of the household, lack of adequate heating, lack of complete kitchens, and a combination of the age and value of the structure (useful only for single family housing). The first of these measures, lacking plumbing, has been the most reliable over time. However, even this measure is very unsatisfactory and variable, depending on local housing age and conditions, codes, and code enforcement. Today a housing unit can have complete private plumbing but the condition of that plumbing, not to mention the remaining structure and content of the building, can be wholly inadequate. As a result, the census figures very likely underestimate actual conditions.

Statewide, between 1970 and 1980, renter households in units lacking plumbing showed a relative decline of 45.6 percent, from 5.4 to 2.9 percent; among owner-occupants the relative decline was 65.2 percent, from 2.5 to 0.9 percent. Fewer units (1.4 percent) lacked complete kitchens than lacked plumbing for exclusive use (1.6 percent), and only a fraction more (2 percent) lacked adequate heating.

Substandard Environments

There is no adequate measure of the amount of housing, standard or substandard, located in areas inadequately serviced by public utilities. Similarly, we know little about areas with dangerously high ground or air pollution, high crime rates, or any other measure of a substandard environment.

Excessive Housing Costs

The federal Department of Housing and Urban Development recently adjusted the threshold of excessive housing cost up from 25 to 30 percent of gross yearly household income. Persons paying more than 30 percent are defined as in need of a housing subsidy. Many economists dislike the use of any measure of excessive housing cost to determine housing policy and program priorities. They argue that measures of substandard units directly indicate a need for a housing solution, either rehabilitation or replacement, but excessive housing cost figures do not necessarily indicate housing solutions because these figures include households occupying standard units. Excessive housing costs, they argue should be included with general income transfer policies and programs. I do not think most housing analysts would argue with this logic, and so long as society is politically willing and economically able to ameliorate poverty with general transfer payments or other means and also ameliorates excessive housing costs, there is no problem. The need for an adequate measure of excessive housing costs arises from the lack of adequate transfer payments to ameliorate the housing problems. If we are going to set targets or priorities on households for subsidies (be they income or rent subsidies), it may make sense to identify the poorest households who are also paying excessive housing costs. So long as society must, or chooses to, limit and/or target its transfer payments, for whatever reason, the question is not whether we analyze excessive housing costs, but what is a useful and accurate measure.

Thirty percent of gross income for housing without accounting for total income or household size is a poor indicator of excessive housing costs, because it lumps together small households with large incomes paying 30 percent or more of income for housing by choice with large households with small incomes paying 30 percent or more of income for housing out of necessity.

Ideally, we would like to cross-tabulate income by household size by percent of income going to housing. In this way the highest priority need group could be identified. This is not possible with available census tables. Instead, two measures were used in this study: households paying 30 percent and 40 percent or more of gross yearly income for housing and earning less than $20,000 in 1979.

The combination of dwindling housing supply and increasing poverty, documented in previous sections, has resulted in a large and growing proportion of Illinois households with excessive housing costs. At the 30 percent threshold, 9.5 percent of owner occupants (240,324) and more than one-third of the renters (500,966) had excessive housing costs. At the 40 percent threshold, 5.6 percent of Illinois home owners and 22.8 percent of renters had excessive housing costs in 1980. It was only possible to compare renter occupants paying 35 percent of income for housing between 1970 and 1980. The data showed 31.1 percent of all renters paid 35 percent or more of their income for housing in 1980, an increase of 24.5 percent of all renters in this predicament over the decade.

Conclusions

Illinois is experiencing numerous changes in its population, household structure, and housing stock that will vary housing use, demand, and need for low income support over the coming decades. What this article does not cover is the tremendous variations in housing statistics and housing need uncovered when comparing the municipalities over 50,000 population or the SMSA counties or regions of the state (see the full report)[1]. It is at these levels of analysis that many more planning priorities for the state become apparent. What is obvious at all levels of analysis is how poor the census variables are both for measuring the extent of housing need and cross-tabulating housing need indicators by key household characteristics necessary for policy analysis and program planning. State and local planners need for better assessments of the housing stock, its condition, and the condition of the surrounding environment than is possible with existing secondary data. Even what housing data has been collected is not reported in fixed table formats that are useful for housing planning, be it by private or public developers. Key cross-tabulation of housing condition by both household income and size are critical for planning but nonexistent for most planning jurisdictions. ●

[1]L. F. Neumann, *Illinois Housing: An Analysis of Changing Conditions and Needs*, Housing Research and Development Program, University of Illinois, November, 1984, 321 pages.

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Is Unemployment a Labor Supply Problem?

Employment and unemployment have always been concerns for economists; but ever since the unemployment rate reached double digits in 1982, the employment and unemployment levels have become topics of conversation for everyone, regardless of occupation. Most of these conversations center on why business and government have not been able to stimulate the economy enough to provide jobs for everyone. Many reasons for high unemployment are cited—ranging from high oil prices and the recession of the early 1980s to the inability of the president and Congress to deal with the problem.

Most discussions of high unemployment focus on explanations relating to the demand side of the labor market. That is, one usually asks why there are not more jobs. But by definition, there is unemployment if the actual labor supplied exceeds the labor demanded. Hence, the problem has both supply and demand elements.

Any economics textbook will explain that the quantity of labor demanded is inversely related to the wage level while the quantity of labor supplied depends positively upon the same wage level. These books will also go on to explain that eventually an equilibrium wage will be found, where the quantity of labor supplied and demanded will be equal, and anyone who desires a higher wage will not be in the labor market. While this explanation falls short of providing a description of real labor markets, it illustrates that unemployment is not merely a matter of not enough jobs to go around, but a supply phenomenon as well.

The supply of labor is the number of people that constitute the labor force, and the labor force participation rate is the percentage of the population in the labor force. In comparing the changes in the size of the labor force and the labor force participation over time, one can trace labor supply patterns and integrate its importance into a discussion of the unemployment rate.

The purpose of this article is to highlight the importance that the quantity of labor supplied has had on the unemployment problem. To accomplish this purpose, two areas were studied. The first is a historical view of the population, the labor force, the level of employment, and the level of unemployment since 1950. Large changes and trends will be highlighted for each category as well as for the male and female components. Second, the results of three labor force growth simulations are reported. The 1950 labor force will be taken as given; the male and female labor forces will then be forced to evolve in ways that are different from actual events since 1950; on these new bases the unemployment rates will be calculated and presented. Even though the methodology is quite simple, the study clearly shows that unemployment levels are supply oriented as well as demand oriented.

Historical Perspective

The size and growth of the population and labor force are important to the problem of unemployment. To maintain its relevence to employment, the population studied is restricted to noninstitutionalized persons of at least 16 years of age. The labor force is the sum of those employed and those unemployed, with the unemployed defined as those without jobs who are actively seeking one. The residual of population and labor force is simply termed "not in the labor force."
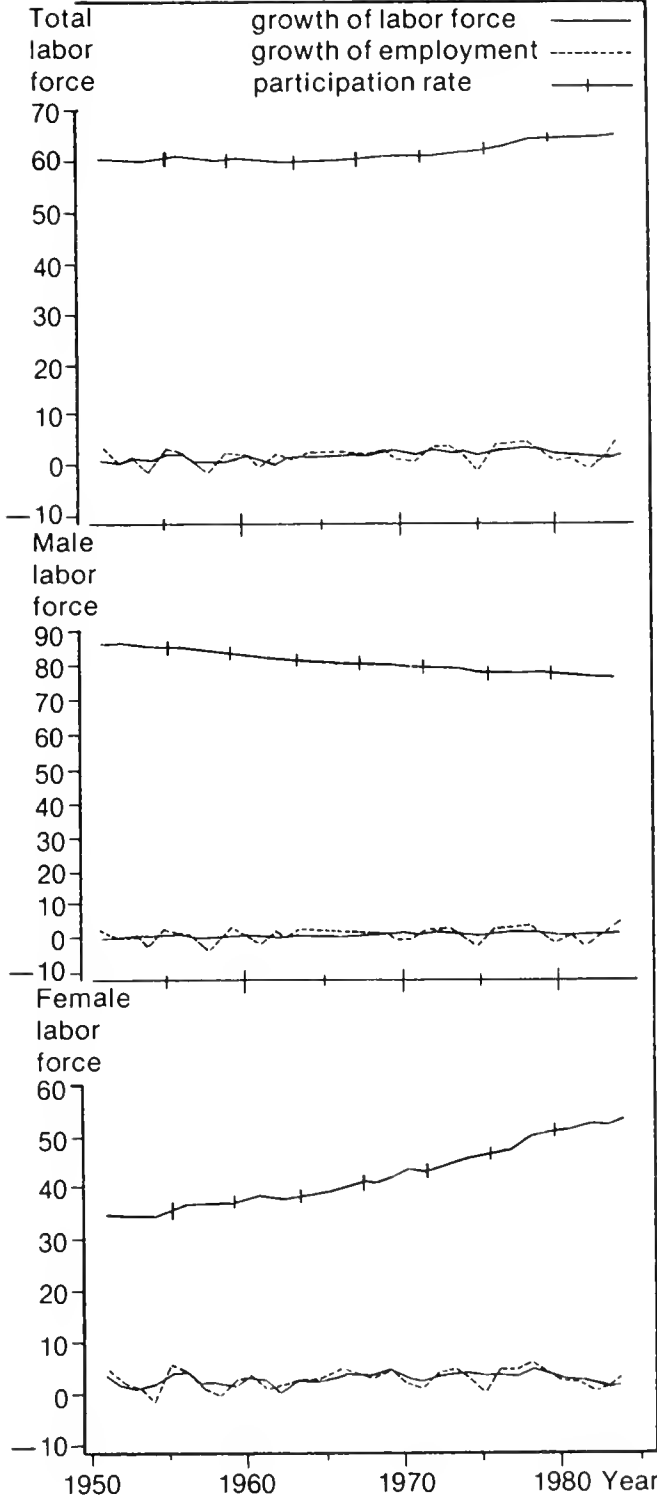
It is no surprise that each of the categories has grown substantially since 1950. It is also no surprise that the male and female components of each category have grown as well. President Reagan is fond of documenting this fact by proclaiming that more people are employed than ever before. With few exceptions, each president since Eisenhower could have made the same statement.

What may be surprising to some is the level of growth in each of the categories. In 1950, there were 106 million people in the United States aged 16 and over, 54 million women and nearly 52 million men. In 1984, the population was 178 million, with 93 million women and 85 million men. The total growth in the 1950–1984 period was 68 percent, or 1.53 percent per year, with the female portion growing slightly faster than the male portion. The growth of the labor force was very different. The total labor force grew 82 percent from 63 million in 1950 to 115 million in 1984. While the male portion grew only 45 percent from nearly 45 million to 65 million, the female portion nearly tripled from 18.5 million to nearly 50 million. In another light, labor force participation rates can be compared. (This is the size of the labor force divided by the population.) While the total labor force participation rate grew from 59.7 percent in 1950 to 64.7 percent in 1984, the male participation rate fell from 86.7 percent to 76.8 percent, and the female participation rate grew from 33.9 percent to 53.7 percent.

Many reasons have been given for the dramatic increase in the labor force particiption rate of women. Rising real wages in the 1960s have been cited as one reason, although this does not explain why the male participation rate fell over the same period. The rising real wage argument also does not account for the continued increase in female participation in the late 1970s and early 1980s when real wages were no longer rising. A desire for greater family disposable income is also cited as a reason to draw the housewife into the market to supplement her husband's income. The increase in the number of single parents and the increasing independence and equality that women have gained in the past few decades may also be reasons. Regardless of the reason, the rapid increase of women in the labor force has had a profound effect on increased employment and unemployment. If adequate job growth does not accompany labor force growth, higher unemployment will occur.

The absolute levels of employment and unemployment have also grown since 1950, but not as consistently. Employment, which was 60 million in 1950 and 107 million in 1984, grew in all but four years. These four years of employment decline can each be linked to a recessionary period. And contrary to what President Reagan has stated thoughout his presidency, 848 thousand fewer people were employed at the end of his first term. Large periods of employment growth can be linked to the recovery periods immediately following these recessions and during the height of the Vietnam War. Absolute unemployment has also shown long-term growth but with many short-term fluctuations. While more than half of the 35 years since 1950 have had lower unemployment than the previous year, unemployment has grown from 3.3 million in 1950 to 3.85 million in 1960; 4.1 million in 1970, and 8.5 million in 1984. The whole range of labor force and unemployment data is shown on the Chart.

The textbook explanation for unemployment is chiefly concerned with the failure of the prevailing wage level to decrease enough to create an equilibrium of supply and demand in the labor market. The argument is that because wages are too high more people want employment than employers are willing to hire. Social conditions and market inadequacies prevent this simplistic view from completely explaining unemployment, but it probably accounts for some of it. Many are unemployed because a lack of product demand or surplus product inventories have lowered the demand for production employees. The slow downward adjustment of wages accompanying a decline in labor demand prevents enough people from joining the "not in the labor force" group to cause equilibrium in the labor market, or at least lower unemployment. This is then an over supply of labor.

Total labor force

growth of labor force ———
growth of employment ---------
participation rate ——+——

70 60 50 40 30 20 10 0 −10

Male labor force

90 80 70 60 50 40 30 20 10 0 −10

Female labor force

60 50 40 30 20 10 0 −10

1950   1960   1970   1980 Year

Alternative Scenario

The previous section outlined the status of labor supply in the United States since 1950. It is clear that the labor force has grown rapidly, especially the female portion. In this section, alternative evolutions the of labor force will be constructed and analyzed. After labor force growth is artificially altered, it will be compared to the number of jobs available and an artificial unemployment level will be computed. Labor force growth will be restricted to levels lower than those that prevailed historically. The number of jobs available will be calculated by adding 5 percent of the labor force to the number employed each year. Finally, the male and female portions of each group will be analyzed.

These "what if" scenarios are not designed as realistic possibilities but rather to highlight the importance labor force growth has had on the unemployment rate. Any labor force study suffers from errors in the collecting and reporting of data, but this study has some unique imperfections. Restricting the labor force to a fixed percentage of the population and making a statement about unemployment assumes that workers are completely homogeneous and interchangeable, which is unrealistic. Calculating the number of jobs available is fairly straightforward. Clearly, one job exists for each person employed, and five percentage points of the unemployment rate is often comprised of people termed frictionally employed—unemployed for whom jobs exist, but who have not yet found those jobs. The count of existing jobs, coupled with restricted participation rates, probably overstates the level of existing jobs, because part of the employment created was not independent of the rising labor force participation rate.

Three different cases were divised. The first calculated the labor force level that would have accomodated full employment (five percent unemployment or the true rate, whichever was less). The second case fixed the labor force participation rate for the male and female categories at each's 1950 level. That is the same as allowing each component of the labor force to grow at the same rate as its respective population component. The final case maintained the male participation rate at its true level and allowed the female labor force to grow at the same rate as the population, plus one percent. The results of each case are documented in the Table.

Calculating the labor force that would be required to maintain full employment provides a basis for further study. It is always less than or equal to the existing labor force, by definition, but its size varies from year to year. The unemployment level has exceeded full employment (five percent unemployed) in 22 of the 35 years since 1950. It is only since 1975, however, that unemployment has reached high levels and not subsequently declined. In seven of those ten years the labor force would have had to be more than two million workers smaller to achieve full employment; in the last four, it would have had to be at least by 2.9 million smaller. This difference between the size of the labor force and the labor force required for full employment measures the oversupply (or underdemand) of labor. It is not a trivial amount that can be alievated by simple solutions.

In an attempt to view unemployment at least partially as an oversupply, two cases of restricted supply were created. Because the male participation rate has declined since 1950 and the female rate increased, fixing each participation rate at its 1950 level causes the male labor force to be higher than its true level and the female labor force to be lower than its true level. The smaller female labor force dominates the larger male labor force, producing a net decline in the total labor force. More important, given the number of jobs that would exist, a net decline in unemployment would take place. The decline in unemployment would be so dramatic that in 1984 there would have been 1.3 million jobs for which there was no employee. Since 1965, the unemployment rate would have exceeded three percent only once and would have been negative (more jobs than laborers) in five of the seven years between 1978 and 1984. This method of calculating the labor force and existing jobs in each's male and female components gives rise to a component unemployment rate that is interesting, but essentially meaningless, in terms of the economy. Female unemployment rates are calculated as negtive since 1955, and male rates are double digits since 1970. Allowing any worker to work any job, combines the two levels and recaptures the study's impact.

The final case focuses on the female labor force. It also provides for more realistic labor force growth by women, but growth that is still slower that the true rate. The results are similar to those of the first case. Slower growth of the female labor force would have created a lower overall unemployment rate. The decline in unemployment would not have been trivial. With fewer females in the labor force, as many as 5 million jobs would have been freed for unemployed males to fill. Often there would not have been enough males to fill all the positions. Since 1966, unemployment would have reached the two percent level only in 1975, when it would have been an "extreme" 3.12 percent.

From these scenarios, one can conclude that the increase in unemployment is not just a problem of lack of demand.

Table. Actual Labor Force Statistics and Simulation Results, 1950–84

	Population (1)	Labor Force (1)	Labor Force Participation Rate (1)	Unemployment Rate (1)	Labor Force (2)	Labor Force Participation Rate (2)	Unemployment Rate (3)	Unemployment Rate (4)
1950	106,164	63,377	59.7	5.19	63,249	59.6	5.19	5.19
1951	106,764	64,160	60.1	3.20	65,373	61.2	2.29	2.84
1952	107,617	64,524	60.0	2.93	65,933	61.3	2.07	2.56
1953	109,287	65,246	59.7	2.81	66,747	61.1	2.45	2.45
1954	110,463	65,784	59.6	5.37	65,527	59.3	5.24	5.01
1955	111,747	67,087	60.0	4.25	67,615	60.5	3.36	3.24
1956	112,919	68,516	60.7	4.02	69,225	61.3	2.04	2.33
1957	114,213	68,877	60.3	4.15	69,494	60.8	2.74	2.45
1958	115,574	69,486	60.1	6.62	68,298	59.1	5.51	4.95
1959	117,117	70,157	59.9	5.33	69,914	59.7	4.52	3.62
1960	119,106	71,489	60.0	5.39	71,199	59.8	4.37	3.47
1961	120,671	72,360	60.0	6.52	71,206	59.0	5.54	4.60
1962	122,214	72,674	59.5	5.38	72,382	59.2	5.16	3.43
1963	124,422	73,839	59.3	5.51	73,440	59.0	5.47	3.54
1964	126,503	75,109	59.4	5.04	75,077	59.3	4.91	3.00
1965	128,459	76,402	59.5	4.41	76,878	59.8	4.06	2.19
1966	130,180	77,893	59.8	3.69	78,965	60.7	2.64	.90
1967	132,092	79,565	60.2	3.74	80,621	61.0	1.92	.53
1968	134,281	80,990	60.3	3.48	82,287	61.3	1.48	.15
1969	136,573	82,972	60.8	3.38	84,389	61.8	.62	−.59
1970	139,203	84,889	61.0	4.82	85,048	61.1	1.75	.71
1971	142,189	86,354	60.7	5.81	85,621	60.2	3.21	1.72
1972	145,939	88,847	60.9	5.49	88,385	60.6	2.62	1.26
1973	148,870	91,202	61.3	4.79	91,408	61.4	1.28	.13
1974	151,841	93,671	61.7	5.50	93,174	61.4	1.36	.44
1975	154,831	95,452	61.6	8.31	92,131	59.5	4.34	3.12
1976	157,818	97,825	62.0	7.57	95,179	60.3	3.06	1.87
1977	160,689	100,664	62.6	6.95	98,603	61.4	1.39	.63
1978	163,541	103,882	63.5	5.97	102,820	62.9	−1.04	−1.31
1979	166,460	106,558	64.0	5.76	105,706	63.5	−2.05	−1.99
1980	169,349	108,543	64.1	7.04	106,218	62.7	−.80	−.74
1981	171,775	110,315	64.2	7.50	107,413	62.5	−.50	−.40
1982	173,939	111,873	64.3	9.55	106,520	61.2	1.57	1.75
1983	175,891	113,226	64.4	9.47	107,905	61.3	1.44	1.63
1984	178,080	115,241	64.7	7.41	112,318	63.1	−1.31	−.78

[1] Actual (2) Labor force to accomodate full employment (3) Unemployment when labor force grew at the rate of the population (4) Unemployment when the female labor force grew at the rate of the female population plus one percent and the male labor force was unchanged

Conclusions

Since 1950, periods of relatively high unemployment have been followed by recovery periods of nearly full employment. Because the high unemployment of the 1980s has not been decreased to nearly full employment, many have questioned what characteristics of this period are different from other periods of high unemployment. While it can be argued that the economy's failure to stimulate job growth causes unemployment, this argument may not totally explain the entire unemployment situtation today.

In light of labor force growth since 1950, this explanation may be correct for the period before 1975, but not necessarily so since. Instead, another view of unemployment is that labor supply is too large. Typical reasons for entering the labor force, such as rising real wage rates, have not existed, in general, since 1975, but the labor force has continued to grow just as it did before 1975.

To highlight the oversupply of labor, two artifical labor forces have been created that reflect possible ways that the labor could have evolved since 1950. In both cases, had the labor force grown at slower rates, especially the female portion, the level of unemployment would be much smaller than it is today. It would be so much smaller in fact, that in some years there would have been jobs with no workers to fill them.

This study has concentrated on labor force growth, particularly the growth of women in the labor force. The conclusion drawn is that if the labor force had not grown as fast as it did, the unemployment level would now be much lower. Some may see this as placing the blame for unemployment on women, but that is neither the purpose of the study nor a valid conclusion. Instead, the conclusion simply suggests that the current period of high unemployment might be better understood if the increase in the labor force since 1975 could be adequately explained. ●

Illinois Economic Outlook *(see facing page)*

In the last issue of the *Illinois Business Review*, we presented employment forecasts. In revising the Illinois Econometric Model, lagged average weekly hours have proven to be a valuable predictor for employment. Therefore, it is important to have good forecasts of average weekly hours to drive the employment forecasts. This month, then, historical average weekly hours for the United States and Illinois, as well as Illinois forecasts, are presented.
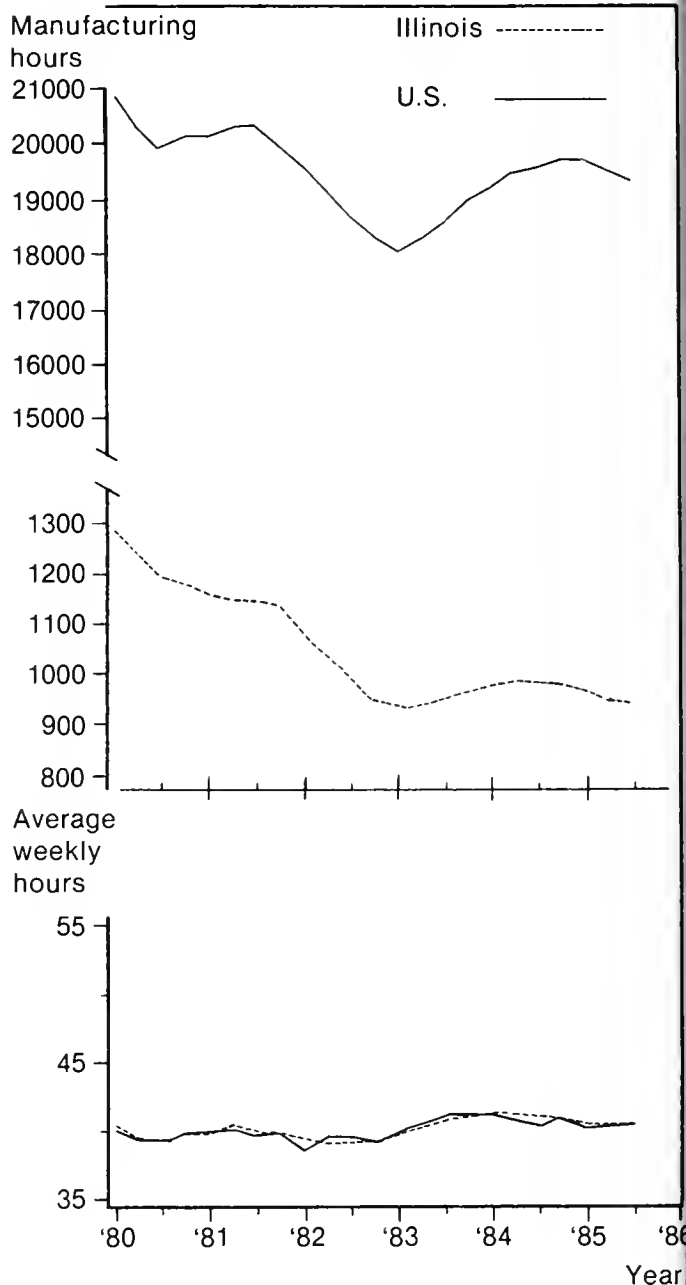
Illinois Economic Forecasts, Average Weekly Hours (1984:IV–1987:I)

United States	84:II	84:III	80:IV	80:I	85:II	85:III
Manufacturing	35.3	35.2	35.2	35.1	35.1	35.0
Durable goods	41.5	41.3	41.7	40.7	41.1	41.1
Primary metals	41.8	41.3	41.4	41.1	41.2	41.5
Fabricated metals	41.4	41.2	41.5	41.0	41.1	41.2
Nonelectrical equipment	41.9	41.7	42.1	41.5	41.2	41.3
Electrical equipment	41.0	40.8	41.2	40.6	40.3	40.3
Miscellaneous durables	41.3	41.1	41.5	41.0	41.2	41.3
Nondurable goods	39.7	39.5	39.6	39.2	39.2	39.6
Food products	39.8	39.6	39.8	39.7	39.8	40.1
Printing and publishing	37.9	37.9	38.0	37.5	37.4	37.8
Chemical products	41.9	41.8	42.0	42.0	41.9	41.8
Miscellaneous nondurables	39.7	39.4	39.5	39.2	39.3	39.6

Illinois	84:II	80:III	80:IV	85:I	85:II	85:III	85:IV	86:I	86:II	86:III	86:IV	86:I
Manufacturing	41.2	40.9	40.7	40.4	40.4	40.5	40.5	40.3	40.3	40.3	40.2	40.2
Durable goods	41.4	41.1	40.9	40.5	40.6	40.8	40.8	40.7	40.7	40.7	40.7	40.7
Primary metals	42.5	41.9	41.6	40.6	41.0	41.3	41.2	41.1	41.1	41.1	41.0	41.0
Fabricated metals	41.6	41.2	41.1	41.0	41.2	41.9	41.9	41.7	41.7	41.7	41.5	41.5
Nonelectrical equipment	41.4	41.3	41.1	41.2	40.7	41.1	40.9	40.7	40.7	40.6	40.5	40.4
Electrical equipment	40.9	40.2	40.1	39.9	39.4	39.5	39.6	39.6	39.7	39.8	39.8	39.8
Miscellaneous durables	41.3	41.1	40.5	40.1	40.6	40.1	39.9	39.9	40.0	40.1	40.1	40.2
Nondurable goods	40.8	40.6	40.4	40.2	40.2	40.1	40.2	40.1	40.1	40.1	40.0	40.1
Food products	41.7	41.0	40.8	40.8	40.9	41.0	41.7	41.5	41.6	41.7	41.6	41.6
Printing and publishing	38.3	38.6	38.5	38.0	37.3	37.2	37.4	37.5	37.7	37.9	37.8	37.9
Chemical products	41.4	42.0	41.9	41.4	41.2	40.4	40.6	40.7	40.8	40.9	41.0	41.0
Miscellaneous nondurables	41.4	41.1	40.8	40.8	41.4	41.4	41.2	40.9	40.8	40.8	40.6	40.6

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ILLINOIS BUSINESS INDEXES

	Percent Change Nov 1984-Nov 1985	Nov 1985	Oct 1985	Sept 1985	Aug 1985	Nov 1984	Oct 1984
Coincident Indicator (1969 = 100)	8.96%	119.54	120.35	126.68	125.21	109.71	109.41
Employment-manufacturing (in thousands);[e]	−3.96%	944.6	948.3	949.7	952.4	983.5	989.6
Average weekly hours-manufacturing;[e]	0.73%	41.3	40.8	40.9	40.4	41.0	40.7
Weekly earnings-manufacturing;[e]	3.89%	$435.30	$429.62	$428.63	$420.56	$419.02	$413.92
Help wanted advertising-Chicago (1969 = 100);[a]	4.04%	103	96	95	98	99	100
Help wanted advertising-St. Louis (1969 = 100);[a]	0.00%	64	64	67	65	64	59
Retail Sales (in millions);[b]	−0.42%	$5,174	$5,342	$5,217	$5,512	$5,196	$5,138
Coal production (in thousands)	−9.39%	4,198	5,714	5,193	5,384	4,633	5,633
Petroleum products (in thousands);[e]	6.18%	2,629	2,717	2,545	2,645	2,476	2,623
Vendor performance	−16.00%	42.0%	46.0%	42.0%	42.0%	50.0%	52.0%
Building permits (in thousands)							
Residential housing units	20.98%	2.751	3.316	3.554	4.055	2.274	2.813
Value of Residential housing	21.50%	$157,000	$211,277	$207,827	$219,135	$129,223	$151,004
Value of nonresidential construction							
Industrial buildings	105.00%	$30,241	$34,849	$26,517	$30,617	$14,752	$15,685
Office, banks, and professional buildings	−25.08%	$26,582	$74,525	$31,665	$64,984	$35,482	$43,040
Stores and other mercantile buildings	−0.53%	$15,694	$35,041	$34,035	$25,516	$15,777	$24,621
Other	29.97%	$3,534	$4,502	$3,507	$5,540	$2,719	$4,577
Consumer price index (December 1977 = 100)							
North Central US,[c]	2.52%	—	174.9	—	174.3	—	170.6
North Central/population more than 1,250,000,[c]	2.77%	—	178.2	—	178.3	—	173.4
North Central/population 385,000 to 1,250,000,[c]	2.66%	—	173.4	—	171.5	—	168.9
North Central/population 75,000 to 385,000,[c]	1.73%	—	170.1	—	169.1	—	167.2
North Central/population less than 75,000;[c]	2.45%	—	171.6	—	170.7	—	167.5
Chicago (1967 = 100)	3.28%	324.2	322.6	326.3	325.9	313.9	314.1
St Louis (1967 = 100)	4.04%	321.6	—	321.6	—	309.1	—
		1985:II	1985:I	1984 IV	1984:III	1984:II	1984:I
Personal income (in millions)[d,e]	6.51%	$166,908	$164,894	$162,200	$160,180	$156,710	$153,752
Per capita personal income[d,e]	5.28%	$14,311	$14,148	$14,024	$13,871	$13,593	$13,386

[a]The Conference Board, *Help Wanted Advertising*, Nov 1985 , [b]Latest month projected by BEBR.; [c]Percent change between October 1984 and October 1985 , [d]Percent change between 1984 II and 1985 II , [e]Recent month is preliminary figure

Illinois
Business

Review

DEBBIE MUSTELL

Infrastructure Investment in Build Illinois

State government investment in infrastructure is expected to increase in 1986 and in the three years following, due mainly to the Governor Thompson's extensive Build Illinois program. The infrastructure component of this program provides new or supplementary funds to four areas of the Illinois infrastructure: water and sewer treatment grants, highway systems, rail freight grants, and flood control. Of these four areas, programs relating to water and sewers gain the biggest share of the total spending this year as well as in the subsequent years of the program. Of $78 million originally proposed in February 1985 for infrastructure improvement in fiscal year 1986 (1 July 1985 to 30 June 1986), $68 million (87 percent) was earmarked for sewers and highways. Of this amount, $50 million went to water and sewer treatment grants. The final bill signed by Governor Thompson in late summer differed somewhat from the program as originally proposed. Furthermore, the bill provides expenditures of substantially more than the $2.3 billion total the legislature has approved; because of this the Governor has appointed a task force headed by Lieutenant Governor Ryan to review the projects and to revise the spending total so that it meets the approved amount.

However, the Governor's office expects the *relative* levels of expenditures to remain unchanged from the original program, even though the dollar amounts on individual projects may be altered.

The purpose of the planned infrastructure investment is to enhance the attractiveness of Illinois communities to new and expanding businesses. It is argued that adequate sewage facilities, accessibility to highways and rail lines, and the like, are positive factors in stimulating new business formation, the expansion of existing industry, or hopefully, a combination of both. Because the program would make Illinois increasingly competitive, the long-run result would involve additional jobs or retention of existing jobs, greater state personal and business income, and, therefore, a better state economic base. Considerations such as these underlie an emphasis on infrastructure renovation in Build Illinois. Infrastructure programs get approximately 57 percent (exclusive of the housing portion of the program) of the five-year total proposed outlay. The need for this action at the state level has been further emphasized because of the reduction of assistance of this sort from the federal government. Federal funding has been on the decline since 1981 and is expected to decline further. Though state funding in these areas has increased, more effort is required to finish the needed improvements.

In the area of water and sewer treatment grants, the FY 85 increases allowed 55 communities to carry on improvements to comply with clean water standards or allow for their community's future growth. To begin similar projects, Build Illinois will grant funds to an additional 43 communities. For new projects that are proven to relate to business development in the community, funding will be administered by the Department of Commerce and Community Affairs and the Illinois Environmental Protection Agency. For such funding, the community needs to show that new business formation or expansion is contingent on the completion of the water/sewage facility and that the economic development would not take place without the help of state funds. The program does not provide for communities getting businesses that are merely relocating from a different area of the state, since this just transfers jobs and does not create new ones. In addition to the emphasis on job creation and economic development, communities that demonstrate a willingness and ability to leverage local funds in the completion of the project will be favored when grant money is awarded.

A second major part of Illinois' infrastructure emphasized in Build Illinois is the state highway system. It was proposed that a total of $372 million be spent to supplement funds that provide for improvements to US 51, US 36, and Thorndale Avenue in Du Page County, the development of access roads and new interchanges for existing highways, and the addition of three highway rest areas. These measures—which improve accessibility to labor and product markets, shipping lanes, and the like—could possibly attract new businesses to the surrounding areas and, therefore, spur economic development. In FY 86, $18 million dollars was proposed to be directed toward these goals to supplement the more than $650 million invested so far and the $250 million included in the existing FY86 to FY89 program administered by the Department of Transportation.

The state's rail freight system is expected to be reduced by 1,000 miles by 1990, due in part to the decline in federal aid. The original Build Illinois program provided $25 million over its five years ($5 million annually) to help slow the abandonment of rail lines. The Thompson administration estimates that 15,000 to 20,000 jobs will either be created or saved by

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the retention of these rail lines. Thought of in these terms, the program will cost the state $1,250 to $1,667 per job.

The last component of infrastructure investment included in Build Illinois is flood control. The program directs $5 million annually for 5 years to the improvement of levees, deepening of channels, and modifying of spillways in seven counties, mostly in the area around Cook County. The administration estimates that $1.3 million will be saved annually by these measures, which means that the projects will take about 19 ($25 million ÷ $1.3 million) years to pay for themselves, not taking any inflation into account.

Economic development and the creation or retention of jobs has been emphasized time and again in Build Illinois. How likely are these to occur and when? In the short run, Build Illinois will definitely create jobs. As spending under the program takes off, construction workers, engineers, and so on, will be employed to design and install the new roads, sewers, and improve the existing rail lines and flood control facilities. However, the long-run growth in jobs is tied to the economic development aspect of the program. As was seen in the much-publicized case of the Saturn plant, a company thinks and evaluates a long time before deciding where to locate a new facility. To be sure, the measures included for infrastructure improvement are a major consideration for a relocating or expanding firm. However, it takes time to make the improvements and time to build plants (both of which, of course, create jobs) before actual production begins and the permanent employment can take place. In other words, the long-run employment prospects associated with Build Illinois are very tenuous, contingent on many factors. Further, will the kind of industry Illinois is trying to attract enjoy long-term growth? These investments may attract firms that are subject to major cyclical swings, such firms as are already abundant in the state.

Personal and business income will go up in the short run also, as the Build Illinois funds are received as income by businesses making the proposed improvements and their employees. But it is difficult to estimate how much of that money remains in the state after the initial spending.

In summary, the Build Illinois program will most likely help the state in the short run, as the federal government projects helped the national economy during the depression. The long-term effects on employment and economic development, however, are difficult to forecast because growth or economic expansion is dependent on many factors other than sewers and highways. However, infrastructure investment will not hurt, and it may very possibly help, in the long run. ▲

REAL ESTATE DEVELOPMENTS

HUN Y. PARK

Using Futures Markets to Hedge Interest Rate Risk: The Search for the Optimal Hedge Ratio

The value of a mortgage is crucially dependent on the level of interest rates. The higher the interest rate, the less valuable will be the stream of future payments associated with the mortgage and vice versa. For this reason, the more volatile environment for the interest rates, the more risky will be activity in the mortgage industry. Savings and loan associations (S&Ls) make 30-year mortgages at fixed rates; mortgage bankers make 90-day mortgage rate commitments. The more uncertain the environment, the riskier is the business in which these two firms engage. Given that the interest rates are more unstable than they were 10–15 years ago, many participants in the mortgage market have done what farmers did long ago—turn to the futures market to reduce the riskiness of their business.

The risk-reducing strategy employed in the futures market is quite simple. The investor sells a futures contract on a particular commodity at the same time he buys that particular commodity in the spot market (today's market) and vice versa. For example, an S&L that makes a loan today is essentially buying a mortgage contract at the current market price—the loan minus points. In return for this single payment the S&L receives a series of monthly mortgage payments. To reduce the riskiness of the transaction, the S&L can sell a futures contract on the same type of mortgage. If the strategy works perfectly, any decreases in the value of the mortgage contract owing to higher interest rates would be offset completely by the increases in the value of the futures contract.

How to Use the Futures Market to Reduce Interest Rate Risk

	Spot Market	Futures Market
Oct 1	Issues $100,000, 20-year, 8% mortgage priced at $86.00 (yield 9.58%)	Sell .92 GNMA futures contracts priced at $86.875 (yield 9.475%)
Nov 1	Price for mortgage falls to $84.00 (yield 9.84%)	Price for a GNMA futures contract falls to $84.701
	Loss: $2,000	Gain .92(86.875–84.701) = $2,000

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The preceeding example shows this in increased detail. On October 1 an S&L issues a $100,000, 20-year, 8 percent mortgage priced at $86.00 yielding 9.58 percent. To protect itself from a loss due to a rise in the interest rate, the S&L may sell a .92 December GNMA futures contract priced at $86.875 (each contract has a principal value of $100,000). Suppose that by 1 November interest rates have risen and, therefore, mortgage value and futures prices have dropped to $84.00 and $84.701, respectively. At that point the S&L's futures market account will show a position balance of $2,000. The loss in the spot market will have been entirely offset by the gain in the futures market.

The key to this strategy is a knowledge of what is called the hedge ratio. The hedge ratio indicates the number of futures contracts that must be sold per contract bought in the spot market (that is, mortgages made) to achieve a complete hedge. As it turns out, the hedge ratio equals the correlation between spot prices and futures prices (more correctly, the ratio of changes in spot prices to changes in futures prices). In the example just discussed, the hedge ratio is .92 because it is believed that spot prices will change by only 92 percent of the change in futures possible prices, the case of an S&L or a mortgage banker needs to sell .92 futures contracts for each mortgage made.

The exact value of the hedge ratio may not be very important. A person can pursue sound hedging strategies regardless of the number. *What is crucial is the stability of the ratio over time.* If the relationship between spot and futures prices is highly volatile, the investor will need to be continually altering his holdings of futures contracts. Even then, the volatility makes it unlikely that the hedge will be perfect.

Several studies have attempted to estimate the optimal hedge ratio for mortgage interest rates. The standard procedure entails computing the ordinary least squares (OLS) estimate of the coefficient of the futures price in a regression with the spot price as the dependent variable. An excellent example of this approach is contained in ORER paper #14— "Further Tests of the Effectiveness of Cross Hedging among Mortgage and Futures Markets" by George Gau and John Markese. Unfortunately, one conclusion of this research is that the OLS estimates are not particularly stable. Thus, hedging strategies based upon these estimates will be less than perfect; sometimes too many futures contracts will be bought and sometimes too few. Certainly, these strategies will result in a less risky portfolio than a strategy that does nothing to reduce mortgage interest rate risk; but they will not eliminate such risk.

The purpose of this article is to explore the reasons for this variability in the hedge ratio and to identify techniques for obtaining improved estimates. Previous estimation techniques have ignored an important determinant of futures prices—error-learning behavior, As a consequence, OLS estimates are likely to be imprecise. It is also shown that estimates based upon an alternative technique that takes this error-learning behavior into account produces more precise estimates of the hedge ratio. Hence, hedging strategies that make use of the hedge ratio estimates produced by this technique are likely to be more successful than those based on the simpler and less reliable OLS technique.

The next section discusses how forecast errors are likely to affect the relationship between futures and spot prices. The third section discusses the alternative estimation procedure and the results obtained. The final section briefly summarizes the conclusions of this article and indicates other problems that still must be solved before the futures market can be considered to be a completely successful tool for hedging mortgage interest rate risk.

The Stability of the Hedge Ratio over Time

The major reason that futures contracts can be used as a hedging instrument is the fact that the market perceives futures prices in general as proxies for expected spot prices in the future. However, effective use of futures contracts requires an investigation of how futures prices are formed and how they change over time.

The market formulates expectations of future interest rates based on available information. The market will revise its expectations as new information becomes available. There is a view that recent forecasting errors are of major importance in formulating revisions of expectations. The traditional expectations hypothesis of the term structure of interest rates asserts that if the actual rate is higher than what has been anticipated so that the forecasting error is positive, the market will revise its expectations upward. Similarly, if the forecasting error is negative, the market will revise its expectations downward.

To demonstrate the relevance of this revision process, the relationship between changes in futures rate and unanticipated changes in spot interest rate is ▷

explained. Table 1 summarizes the synchronization of three-month Treasury bill futures and unanticipated changes in three-month spot rates classified by forecasting periods. Settlement prices of cash Treasury bill and T-bill futures contracts as of Thursday of the third week of each month are used in order to match as closely as possible the delivery date for T-bill futures for the period of June 1976–August 1983. The forecasting error (that is, unanticipated changes in three month rates) is calculated by subtracting the three-month T-bill futures rate from the actual spot rate (for example, the difference between three-month T-bill rate at time t and three-month T-bill futures rate observed at time t-1).

The results in Table 1 suggest that futures rates and the forecasting error tend to move in the same direction across forecasting periods. For example, when the forecasting period is three months, whenever the forecasting error is negative, the market revises downward its expectations of future interest rates (12 out of 12). When the forecasting error is positive, expectations are revised upward 82.4 percent of the time (14 out of 17). These results, supporting the conventional expectation hypothesis albeit indirectly, indicate that changes in futures prices (or rates) depend on the forecasting error.

What is the implication of this adaptive mechanism of futures prices to the problem of estimating the hedge ratio? In the regression-based hedge ratio model, the historical relationship between changes in cash and futures prices are assumed stable. For example, an optimal hedge ratio of .92 means that a $1 change in the futures price results in a $.92 change in the spot price. However, if futures prices are not random and independent of the error term in this regression, then OLS estimates of the relationship between futures and cash prices will be biased and imprecise.

This means that investors should be cautious when they use simple regression to estimate the optimal hedge ratio. This is particularly true for periods of volatile interest rates since forecasting errors are likely to be larger.

An Improved Hedge Ratio

The point of the last section is that OLS estimates of the hedge ratio may be quite misleading. This does not mean that futures markets cannot be used; rather, it means that hedging based upon OLS estimates of the hedge ratio are likely to be inferior to strategies that employ estimates obtained using more sophisticated procedures. This section discusses estimates based

upon an alternative procedure—nonlinear estimation. The full details of this approach are discussed in a forthcoming ORER paper; here attention is focused on the intuition underlying the alternative procedure and how hedging strategies using estimates based upon this procedure perform relative to those based upon OLS estimates.

One way of capturing the complex relationship between futures and spot prices noted in the last section is to investigate whether the relationship between the changes in the cash and futures prices is nonlinear. The conventional regression-based hedge ratio may misrepresent the true ratio when interest rates have been volatile and generally low or high relative to the current position.

Chart 1 exemplifies the dissimilar interest rate risk characteristics. Suppose that the relationship between the changes in the cash (ΔS) and futures prices (ΔF) is best fitted by a curved line, CC', in Chart 1. It is easily noticeable that the optimal hedge ratio depends partly on where the current position is located. When the interest rate increases so that the changes in the cash and futures prices are negative and the current position is the point A, the hedge ratio from the linear line (LL'), if applied to the current position, A, overstates the interest rate sensitivity of the cash security. That is, the slope of the curved line at A is lower than the slope of the linear line and, thus, causes the hedger to short too many futures contracts. On the other hand, when the interest rate decreases and the current position is the point B, the straight line fitting to the point, B, gives the hedge ratio that understates the interest rate sensitivity of the cash security relative to the futures contract and thus causes the hedger to short too few futures contracts.

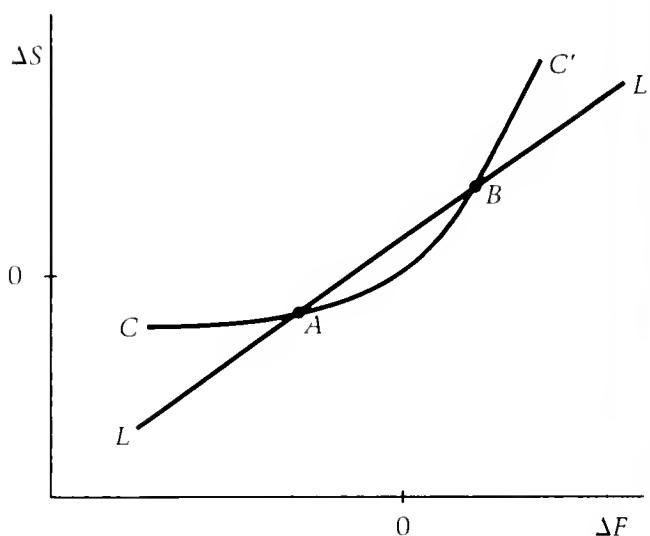### Chart 1. Dissimilar Interest Rate Risk

Table 1. Synchronization of Futures Interest Rate and Forecasting Errors Classified by the Forecasting Period*

1. When the forecasting error is negative.

Number of times in the future at which futures rate is applicable

n	3	6	9	12	15	18	21	Total	
Increased	0	1	2	2	2	2	3	12	(15.4%)
Unchanged	0	1	0	0	1	0	0	2	(2.5%)
Decreased	12	10	10	10	9	7	6	64	(82.1%)
Total	12	12	12	12	12	9	9	78	(100%)

2. When the forecasting error is positive.

n	3	6	9	12	15	18	21	Total	
Increased	14	13	13	12	11	9	9	81	(73.6%)
Unchanged	0	1	0	0	0	1	1	3	(1.8%)
Decreased	3	3	4	4	4	4	4	26	(23.6%)
Total	17	17	17	16	15	14	14	110	(100%)

*n represents the forecasting period (months).

Table 2. Estimated Hedge Ratios*

Time to Maturity (Months)	Two Week Hedging				Four Week Hedging			
	Linear	R^2	Non-linear**	R^2	Linear	R^2	Non-linear**	R^2
Nearby	.9305 (.0487)	.7342	.9182 (.0480)	.7456	.9600 (.0609)	.7842	.9456 (.0562)	.8050
3-6	.9245 (.0493)	.7259	.9038 (.0491)	.7383	.9521 (.0595)	.7883	.9351 (.0590)	.8100
6-9	.9391 (.0512)	.7168	.9110 (.0494)	.7298	.9640 (.0616)	.7807	.9434 (.0599)	.8030
9+	.9495 (.0534)	.7023	.9122 (.0528)	.7158	.9733 (.0642)	.7696	.9475 (.0600)	.7926

*The numbers in parentheses represent standard errors
**The estimates of the hedge ratio for the non-linear model are evaluated at mean values.

Table 2 compares the hedge ratios based on the linear line and the curve for two-week and four-week hedging for GNMA. The Chicago Board of Trade began trading GNMA futures on 19 September 1918. The contracts are priced to the GNMA certificates— $100,000 face value of 30-year single family home mortgages with an assumed coupon rate of 8 percent, which is assumed to be prepaid at the end of the twelfth year. Daily closing spot and futures prices of GNMA are used. The spot prices also based on an average 12-year prepayment and 30-year mortgage terms with 8 percent coupon rate. To allow the market to gain some depth, the data for the period, 1 September 1979 through 31 January 1985 are used. Also, the sample is divided into four categories to examine the effect of the time maturity on the hedge ratio. The four categories are: nearby, three-to-six-month, six-to-nine-month, and longer-than-nine-month contracts.

The results in Table 2 indicate that the hedge ratio estimates based on the nonlinear relationship between cash and futures price changes are much lower than those based on the simple assumption of the linearity of the two prices. This implies that the conventional method of estimating the hedge ratio assuming the linearity between cash and futures prices changes causes investors to short too many futures contracts. Note also that the standard errors of the hedge ratio estimates based on the nonlinear relationship are somewhat lower than those based on the linear regression line. This means that the hedge ratio based upon the nonlinear relationship is more precise, and, thus, the confidence of investors in the hedge ratio can be enhanced. Note, too, the R^2s are larger for the nonlinear model. This means that the explanatory power of the nonlinear model is larger, thus hedging strategies based upon the nonlinear model will tend to be more successful.

▷

Chart 2 shows two simplified distributions of hedge ratios, one on the simple assumption of linearity between cash and futures prices yielding the hedge ratio H_1, and the other taking into account the dissimilar interest rate risk between the two securities yielding the hedge ratio H_2 with less uncertainty. Indeed, Chart 2 indicates that a procedure that takes into account such a changing relationship might do a superior job to one that does not.

Chart 2. Comparison of Hedge Ratios Based on Linear and Nonlinear Relationships

$H_2 \qquad H_1$
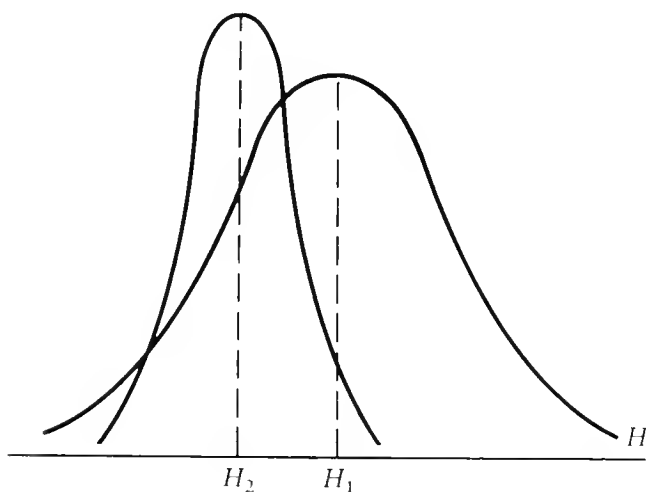
Conclusions

Futures markets offer investors an opportunity to reduce interest rate risk, but the success depends on the estimate of the hedge ratio, that is, the relationship between changes in spot and futures prices. Estimates based upon an alternative procedure are shown to be more stable over time and more precise. These estimates will lead to more successful strategies.

This article has focused on one problem associated with using the futures market—the estimation of the hedge ratio. Others have not been addressed. Two others are particularly important. One, there is a "basis risk" owing to the fact that mortgage contracts are not all identical, thus the mortgages being hedged may not be closely aligned with the futures contracts available. This risk is a direct result of the heterogeneity of mortgages. Investors must be aware that the success of a hedging strategy depends on how closely the mortgage underlying a futures contract—a fixed rate, 30-year FHA mortgage—matches the type of mortgage being

issued. For example, the basis risk is larger for a graduated payment mortgage than for a 20-year FHA fixed-rate mortgage.

Two, the fact that borrowers can prepay their mortgages as interest rates decline implies that investors are not fully protected. In particular, if interest rates decline and prepayments rise, the value of the mortgage will not increase by as much as the futures contract declines. Although some work has been done to show how other securities such as options can be used to limit prepayment risk, it is fair to say that more research in this area is needed. ▲

ORER Paper Series

Each issue of the *Illinois Business Review* contains an article dealing with some aspect of the real estate market. Most are based upon research projects sponsored by the Office of Real Estate Research (ORER). ORER-sponsored research is also published in the ORER Paper Series. Recent papers include:

Paper No.	Author/Title
20	Joseph C. Kowalski and Peter F. Colwell, "Market Versus Assessed Values of Industrial Land."
21	Chunchi Wu and Peter F. Colwell, "Equilibrium of Housing and Real Estate Brokerage Markets under Contracts."
22	Lanny Arvan and Jan K. Brueckner, "Risk Sharing in the Adjustable-Rate Loan Market: Are Existing Contracts Efficient?"
23	Dixie M. Blackley and James R. Follain, "Tests of Locational Equilibrium in the Standard Urban Model."
24	James R. Follain, "Another Look at Tenure Choice, Inflation, and Taxes."
25	Cheng F. Lee and Morgan J. Lynge, "Financial Ratio Comparison of Savings and Loan Associations and Commercial Banks."
26	James R. Follain and Jan K. Brueckner, "Federal Income Taxation and Real Estate: A Survey of Tax Distortions and Their Impacts."
27	J. Fred Giertz and A. James Heins. "The Income Tax and Housing Tenure: A Closer Look at Owning Versus Renting."

DAVID LEE

Illinois Hospitals

Generally, Illinois hospitals conform to national norms based on such measures as size, concentration, and use of capacity. At the same time, evidence points to the fact that Illinois hospitals are operated at greater cost and receive higher gross revenue than do the majority of other US hospitals. In fact, this difference between revenue and cost per patient per day exceeds the national average by 72 percent. However, increased competition in the health care industry resulting from new developments such as HMOs will probably bring these costs in line with those in the rest of the country.

The hospital industry in Illinois represents a dynamic and diverse component of the state economy. Consisting of more than 279 private and public institutions, this industry earned more than $24.5 billion in gross revenue in 1983 while treating more than 1.8 million patients. Moreover, these hospitals vary greatly in size, concentration, services offered, and the means of ownership, making hospitals unique among industry groups. This article presents both an overview of the Illinois hospital industry and a comparison of hospitals in the state with those across the nation.

Of the 279 hospitals providing general and other specific care, only nine are operated by the federal government. Of the 270 nonfederal hospitals, 19 offer only psychiatric care, and 6 provide long-term care, with the remainder falling into the classification of a community hospital. This category includes any nonfederal, short-term general hospital, excluding hospital units of institutions whose services and facilities are available to the general public. These 241 hospitals maintained 57,252 beds, had an average daily population of 40,322 patients, and treated more than 1.8 million patients in 1983.

However, community hospitals are a diverse group, varying in a number of important ways. As Table 1 indicates, the median size for a community hospital is between 100 and 200 hundred beds in capacity. Yet hospitals this size treated only 17.9 percent of the total admissions. Far more important to hospital care are the larger hospitals that, although fewer in number, represent the bulk of bed capacity and patient care. For example, the 45 Illinois hospitals with a bed capacity in excess of 400 represent only 18.6 percent of the total number of hospitals, but they account for 45.4 percent of total bed capacity and 45.5 percent of total admissions.

Hospitals also vary in the way they are owned and operated. Of the 241 community hospitals, 189 are owned by nongovernment, nonprofit organizations—usually secular or religious groups. State and local governments maintain 43 hospitals across the state, while 9 hospitals are privately owned and operated for profit. The emergence of the private for-profit hospital has been one of many changes in the hospital industry in the state and nationally. While the total number of community hospitals declined from 285 in 1979 to 241

Table 1. Community Hospitals (1983)

Category	Hospitals	Beds	Admissions	Occupancy	Average Daily Census
6-24 Beds	4	77	1,608	44.2%	34
25-49	13	509	15,956	48.3	246
50-99	49	3,502	105,771	59.4	2,080
100-199	69	10,394	335,957	63.3	6,575
200-299	46	11,437	379,789	69.7	7,976
300-399	15	5,355	181,067	69.3	3,710
400-499	24	10,565	361,215	75.2	7,942
500 or more	21	15,413	490,267	72.4	11,769
Total	241	57,252	1,871,630	70.4	40,332

Source: *Hospital Statistics*, American Hospital Association, 1984

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Table 2. Community Hospitals by SMSA (1983)

SMSA	Hospitals	Beds	Admissions	Population	Concent. Ratio
Nonmetropolitan	88	9,518	292,016	2,073,800	0.0424
Metropolitan	153	47,734	1,579,614	9,378,000	0.0163
Alton-Granite City	8	1,542	49,100	265,400	0.0301
Aurora-Elgin	6	1,516	55,482	318,000	0.0189
Bloomington-Normal	3	607	22,032	120,600	0.0249
Champaign-Urbana-Rantoul	4	815	31,694	172,000	0.0233
Chicago	89	31,567	1,010,019	6,088,300	0.0146
Davenport-Rock Island-Moline	6	1,085	36,717	383,800	0.0156
Decatur	2	800	29,282	129,900	0.0154
East St. Louis-Belleville	6	1,634	57,094	300,300	0.0200
Joliet	3	943	35,603	357,300	0.0084
Kankakee	3	592	19,553	102,000	0.0294
Lake County	7	1,773	63,246	451,600	0.0155
Peoria	6	1,846	62,223	363,500	0.0165
Rockford	5	1,204	44,436	279,200	0.0179
Springfield	5	1,810	63,133	187,700	0.0266

Source: *Hospital Statistics*, American Hospital Association, 1984

in 1983, the number of for-profit hospitals remained stable, demonstrating the relative strength of this form of ownership.

The level of concentration among hospitals, measured as the ratio of hospitals to population, is surprisingly consistent across the state. Table 2 shows the number of hospitals, number of beds, number of admissions, and the number of hospitals per capita for the 14 SMSAs located in Illinois. Chicago has a relatively low concentration ratio even though the number of hospitals in that area is the greatest. Moreover, concentration ratios are about the same across all SMSAs, averaging 0.020 per 1,000 population. This shows a relatively even dispersal of hospitals. The highest levels of concentration are found in nonmetropolitan areas, where the ratio of hospitals to population is 0.0424 per 1,000. These hospitals are generally small and primarily provide a level of service that is not highly specialized. If extensive or specialized care is indicated, patients can be transported to metropolitan areas where appropriate equipment and personnel are available.

One final area of diversity in hospitals concerns the degree of specialized care offered. While almost all Illinois hospitals maintain a pharmacy and offer emergency service, only a few offer more specific and expensive care. Only 24 percent perform radiation therapy; 23 percent provide a premature birth nursery; 17 percent perform abortions; 12 percent offer open heart surgery; and only 5 percent of all hospitals provide for organ transplants. Such results are typical for the nation as a whole. Specialized and expensive care can be provided in the most cost effective way if offered by only a few hospitals. Patients requiring this type of care can be transferred under what are normally nonemergency conditions.

In many ways, Illinois hospitals compare favorably with those in the rest of the country. To illustrate, the average length of stay in a hospital varies from a high of 9.6 days in New York to a low of 5.4 days in Utah. In Illinois, the average length of stay is 7.9 days, just above the national average of 7.6 days. In addition, Illinois hospitals operate with a capacity utilization of 70.4 percent. Nationally, the typical capacity level is 73.5 percent, slightly above the Illinois mark.

Unfortunately, there are a few areas where the departure of Illinois hospitals from the national average is less positive. First, hospitals in Illinois earn gross revenue per day of in-patient care in the amount of $527.00. This figure places Illinois seventh highest among the states and is $66.07, or 14 percent, above the national average. Second, hospitals in the state operate at greater expense than those in most other states with a total cost per in-patient day of $467.37, compared to the national average of only $426.20. Thus, Illinois hospitals realize a difference between revenue and cost a per in-patient day of $59.63 as compared to $34.73 for the country as a whole. ▲

DAVID MANDY

Small Business: Panacea or Pipedream?

Recently, the contribution of small businesses to the overall health of an economy has been the focus of much discussion. One finding of investigations is that small businesses are responsible for creating a large proportion of new jobs. This is often interpreted as evidence that state and local governments should provide additional support for small business.

This article issues a word of caution about the assumption that the economic well-being of the state would be served by subsidies in which size is an important consideration. In order for incentives to be directed toward the most effective targets, policy-makers must understand the role of all types of business. Government should focus attention on those businesses that yield the greatest return in the form of increased employment and income per tax dollar of subsidy. Moreover, it is critically important to measure this return in terms of employment and income that *would not have existed* without government assistance.

The *MIT Program on Neighborhood and Regional Change* has produced large amounts of data on small businesses. David Birch presents the MIT analysis in several articles that provide one foundation for the present inquiry. Other published sources include "Small Business: Jobs, Ideas and Products" in the March 1985 issue of *Illinois Issues*, "Tracking Job Growth in Private Industry" in the September 1982 issue of the *Monthly Labor Review*, and the annual *Inc.* magazine study on state business climates.

One widely publicized finding of that research relates to the dominant role small business seems to play in the process of new job creation. David Birch notes that 67 percent of the new jobs created in their sample were created by firms with 20 or fewer employees. Firms with 100 or fewer employees account for 80 percent of new job creation. The magnitude of these figures has become generally accepted, as other research has drawn similar conclusions.

Primary and Secondary Firms

It may be helpful to draw distinctions between types of firms, primary and secondary. Primary firms constitute the economic base of a state or region. The demand for their products may arise from a geographic area different from the actual physical location of the firm. Hence, such firms can locate in many different areas nationally and, perhaps, internationally. It can be argued that their presence creates the need for other firms. Secondary firms are more local in nature and do not engage in a large amount of trade outside of their geographic location. They serve the existing population and industry.

It is important to understand the difficulty of categorizing businesses in this way. A fine restaurant, for example, superficially appears to be a secondary firm. However, if the restaurant is outstanding in the quality of its service, the physical location of it may be relatively unimportant. The restaurant may succeed in attracting clientele from a large surrounding area solely on the quality of its product. Alternatively, a restaurant may fail as a business due to a poor location. Thus, the categorization of primary and secondary is useful for expository purposes but ignores some important facts. The primary firm has a wide range of location options, however, whereas the secondary firm arises to fill a need in a particular geographic area.

Supporting the Economic Base

Programs that reduce the cost of conducting business may serve to expand employment or income in a state or area. These programs can be tailored to specific types and sizes of firms. It is our view that firms of a primary nature hold the greatest promise. Such firms conduct interstate business, thereby drawing income and wealth into the state. The secondary firms, which serve the needs of the area, will arise in an area without further incentive. Their only prerequisite is that adequate local demand be present to support them. We do not mean to imply that any individual firm must locate in a particular area—only that if the demand for a local service is sufficient, some firm will arise to fulfill the need. Hence, support of primary firms yields multiplied returns as the income imported into the area is spent locally and the area grows by building on the

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Table. Illinois Employment and Establishments by Industry: 1983.

Industry	Employees	Establishments	Average Firm Size
Agricultural Services, Forestry, Fisheries	17,500*	2,201	8.0*
Mining	37,500*	1,053	35.6*
Construction	143,581	17,366	8.3
Manufacturing	998,090	18,063	55.3
Transportation and Public Utilities	222,382	8,799	25.3
Wholesale Trade	301,980	22,377	13.5
Retail Trade	759,822	62,564	12.1
Finance, Insurance, and Real Estate	329,242	23,400	14.1
Services	991,123	71,828	13.8

*Estimate

Source US Bureau of the Census, *County Business Patterns*, 1983, ILLINOIS, US Government Printing Office, 1985

base provided by the primary firms. If primary firms are present, it is not necessary to provide further support to firms that conduct the bulk of their business in the surrounding community.

We believe that the focus on small business obscures this fundamental principle. Policies may tend to be targeted toward all small businesses instead of being targeted toward primary firms. Undoubtedly many small firms will fall under our category of primary and thus should be encouraged. Many large businesses belong to the category as well, however. The fact that 80 percent of job creation takes place in small firms is irrelevant to the real issue. All that is needed is sufficient demand in the economy within which the particular firm operates (whether it be international, national, regional, or local). Similarly, if the necessary economic base is not present these firms will not survive unless they are continually supported by outside sources. Economic growth would be most meaningfully fostered if government reduced the cost of conducting business for the firms that face an economy consisting of other geographic areas.

Compounding the confusion over small business is the fact that many small businesses are actually secondary firms. The services industries, in particular, are composed mostly of small firms that serve local needs and that rely on the income generated by a large employer in the area for support. The local grocery stores, restaurants, barbers, doctors, lawyers, accountants, and so on will all arise in response to demand in a quantity sufficient to suit the needs and wealth of the community. There is no reason to expend state resources to encourage this type of business. Retail and some wholesale trade also fall into this

category, yet in the MIT sample 72 percent of the new jobs were generated in these industries—industries that, as a general rule, serve the existing population and, therefore, should not receive support from state and local governments.

The Table presents the average size of Illinois firms in 1983 by major industry. From this, it is clear that mining, manufacturing, and transportation consist of relatively large firms while construction, trade, finance, and services consist of relatively small firms.

This grouping is roughly equivalent to the grouping arrived at if industries were classified as primary and secondary. Manufacturing and mining are generally primary industries, while transportation may be either, depending on the particular firm. Similarly, services, retail trade, and construction are secondary industries, while wholesale trade and finance may be either. The significant exception to this trend is agriculture, which is responsible for large exports from the state but which is also composed of relatively small firms.

This breakdown suggests that it is the manufacturing firms that should be supported by state and local governments since these are the primary firms. In general, these are not small businesses. Data from the Illinois Department of Commerce and Community Affairs (DCCA) supports this view. DCCA found that the value of Illinois manufacturing exports was $10,369 million in 1981. This represents 26 percent of manufacturing output for the year. The relative contribution of other industries (excluding agriculture) to Illinois exports is so small that records are not kept.

The state should carefully examine how it decides which firms to target for business assistance. If the net payoff is positive, the state should support the production of those goods and services that can be produced elsewhere in lieu of production here regardless of the size of the firm. This will include some small businesses, particularly in the high-tech and wholesale trade industries and will include some large firms in manufacturing, mining, and transportation industries. ▲

DWIGHT R. MCCURDY AND JOHN H. BURDE

Firewood Consumption Survey

During the 1982–1983 heating season, nearly one-fourth of the households in Illinois burned more than 1.7 million cords of wood. (A cord is a stack of wood 4 feet high, 8 feet wide, 4 feet long). To describe these firewood consumption patterns, predict future rates, and analyze the impact on Illinois forests, a telephone survey was conducted of 7,506 households. The survey was completed by the Forestry Department, Southern Illinois University during the spring of 1983.

Illinois Consumption

In 1980 the Bureau of Census estimated there were approximately four million households in Illinois. As mentioned, nearly one-fourth of the 7,056 persons interviewed said their household burned firewood during the 1982–1983 heating season. Therefore, it is estimated that more than 900 thousands households burned firewood.

When spokesmen for the households in which wood was burned were asked the amount, on the average, they estimated 1.9 cords annually. (See Table 1.) Therefore, the estimated total consumption of firewood in Illinois was approximately 1.7 million cords of wood.

Table 1. Annual Firewood Consumption Per Household

Consumption (Cords)	Percent of Households
Less than 1.0	42
1.0 to 2.0	34
2.1 to 5.0	16
5.1 to 10.0	7
10.1 or more	1

Consumption Patterns

The two reasons given for burning wood were for heating and aesthetics, 53 percent and 47 percent of the households, respectively. However, less than one-fourth of the spokemen said they used firewood for more than one-half of their total heat (Table 2). Most of the households burning firewood had a fireplace; slightly less than one-fourth had a wood stove. Natural gas was the major source of energy replaced by firewood, followed by electricity and propane. One-half of the households had begun burning wood in the past five years.

More than three-fourths of the families burning wood said they cut some or all their wood supply. Thirty percent of the people that burned wood said they purchased some or all of their firewood. The average price paid per cord during the 1982–1983 heating season was $83.

Table 2. Percent of Heat Provided By Wood

Percent of Heat	Percent of Households
Less than 10	33
10 to 25	31
26 to 50	12
51 to 75	6
76 to 99	9
100	9

Socio-Economic Characteristics of Households

On average there were three people per household surveyed. Households that burn wood average 3.6 people whereas households not burning wood average 2.7 people (see Table 3). The average age of the head of household was 49 years, while those who burned wood averaged 45 years and those not burning wood, 51 years.

Table 3. Socio-Economic Characteristics of Illinois Households

Characteristics	Percent of Households		
	All	Burn Wood	Don't Burn Wood
Size			
One Person	15	5	19
Two Persons	70	73	69
Five or More Persons	15	22	12
Age of Household Head			
Less than 30 years	15	12	16
30 to 50 years	40	57	34
51 to 65 years	26	23	27
More than 65 years	19	8	23
Occupation of Household Head			
Professional-Technical	29	35	21
Craftsmen-Foreman	12	12	12
Operatives	10	13	10
Clerical-Sales	10	10	8
Household-Service	6	–	7
Farmer	4	7	5
Unemployed-Housewife	3	4	5
Student	1	–	2
Retired	25	12	30
Household Income			
Less than $15,000	31	17	41
$15,000 to 24,000	28	28	30
$26,000 to 50,000	33	44	25
More than $50,000	8	11	4
Type of Residence:			
House	81	96	78
Apartment	12	1	14
Mobile Home	3	3	5
Other	3	–	3

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Source of Firewood

Of the firewood users interviewed, 77 percent indicated they cut some of the wood they burned. Nearly 2 million cords of firewood were cut or gathered in Illinois. The amount of wood cut ranged from 1/10th cord to 100 cords, with the average being 2.9 cords cut per individual annually (See Table 4).

Nearly all of the firewood cut was obtained from private land, either the householders own or other private lands. Very little wood was obtained from public land. The firewood obtained from private lands derived equally from the householder's own land and other private land such as a friend's property.

Table 4. Quantity of Firewood Cut

Quantity (Cords)	Percent of Households Cutting Wood
0.1 to 0.9	31
1.0 to 2.0	32
2.1 to 5.0	23
5.1 to 10.0	11
10.1 to 100.0	3

Statistical Interrelationship of Data

Using stepwise regression analysis, the following variables were found to be correlated with the amount of wood burned by households:

1. Amount of wood cut—the more wood cut the more wood burned;

2. The percent of household heat supplied by wood—the greater percent of heat supplied the more wood burned;

3. Sex of head of household—males burn more wood than females;

4. Ownership of land with an available wood supply—landowners burn more wood than nonlandowners;

5. The type of fuel replaced by wood— households using natural gas generally burn less wood than the average household;

6. The type of burning unit used—households with stoves burn the most wood;

7. Age of head of household—younger people burn the most firewood;

8. The percent of wood supply purchased—the less wood purchased the larger amount of wood burned;

9. Household income—the greater the annual income the more wood burned;

10. Number of people in the household—the larger the number of people in the household the more wood burned; and

11. Occupation of head of household—farmers and operatives burn the most and students and retirees the least amount of firewood.

The above variables were listed in order of the strength of the correlation, that is the amount of wood cut having the strongest correlation with the amount of wood burned. These factors account for approximately one-half of the variation in the amount of wood burned between various households.

The following relationships were found to be statistically significant at the 99 percent probability level using analysis of variance and Chi Square test:

1. Households that burn the most wood are also the most apt to cut wood for their own use and, as a result, are less likely to purchase firewood;

2. Households that depend heavily on firewood for heat also burn and cut more wood than the average household that burns firewood;

3. Households that cut or gather the most firewood also burn the most wood, rely the heaviest on wood for heat, and are the most apt to have a wood stove rather than a fireplace;

4. Households with wood stoves burn the most wood, cut the most wood, rely on wood for a greater percentage of their heat, and purchase less wood;

5. Households with the lowest annual incomes are most apt to rely on firewood for a large proportion of their heat than other households;

6. Farmers, on the average, cut the most firewood; and

7. Households using natural gas for heating rely the least on firewood for heat—a large proportion of these households are in the Chicago area. ▲

Illinois Employment Forecasts (in thousands)

	85:IV			HISTORY				FORECAST			
	Forecast	Actual	Error	85 I	85:II	85 III	85 IV	86 I	86 II	86 III	86 IV
Mining	25.5	25.4	0.1	24 1	25.4	25 7	25.4	25 0	24 7	23 4	24 0
Construction	166.3	167.6	−1.3	149.9	163.8	166.8	167 6	167 0	166.3	166.5	166.5
Manufacturing	941.3	945.5	−4.2	972.5	953.3	944.4	945.5	943.0	935 7	932 6	927 2
Nondurable manufacturing	363.6	367.8	−4 2	367.2	365.9	366.4	367.8	366.6	365 2	363 7	362 9
Food products	94.8	96.0	−1.2	95.5	95.0	95.4	96.0	95.9	95.3	94.8	94 4
Printing and publishing	102.7	103.7	−1.0	101.9	102.7	103.3	103 7	103.2	103 0	102.5	102.1
Chemical products	60.3	60.3	0.0	61.5	60.4	60.8	60.3	60.5	60.4	60.6	60.8
Miscellaneous nondurables	105.9	107.4	−1.5	108.1	107.3	106.7	107.4	107.1	106.4	105.7	105 6
Durable manufacturing	577.7	577.7	0 0	604.8	587.5	578.0	577.7	576.3	570.5	567 0	564 2
Primary metals	54 7	56.1	−1.4	59.0	56.9	55.2	56.1	56.3	55.8	55 7	55 9
Fabricated metals	109.3	110.4	−1.1	111.5	110.7	110.7	110.4	109.6	108.3	107 1	106 2
Nonelectrical machinery	144.6	145.7	−1 1	154 9	147 6	142 8	145 7	143.5	140.9	139 2	138 2
Electrical equipment	124 6	122.4	1.8	132.1	128.5	125.8	122.4	121 7	120 0	119 2	118 5
Miscellaneous durables	144.5	143.3	2.2	146.8	144 2	143.5	143.3	145.2	145.4	145.7	145 4
Transportation and utilities	274.3	276.4	−2.1	273.7	274.4	277 1	276.4	273 9	271 5	269 6	268.1
Wholesale and retail trade	1165.3	1170.1	−4 8	1158 2	1161.5	1166.4	1170.1	1176.6	1180.5	1184 1	1187 6
Finance	328.6	325.5	3.1	321.5	322.8	324 5	325.5	329.1	333.3	337.6	341.8
Services	1090.8	1079.6	11 2	1058 2	1070.8	1083.7	1079.6	1088.6	1097.2	1106 0	1114 8

Illinois employment (in thousands)
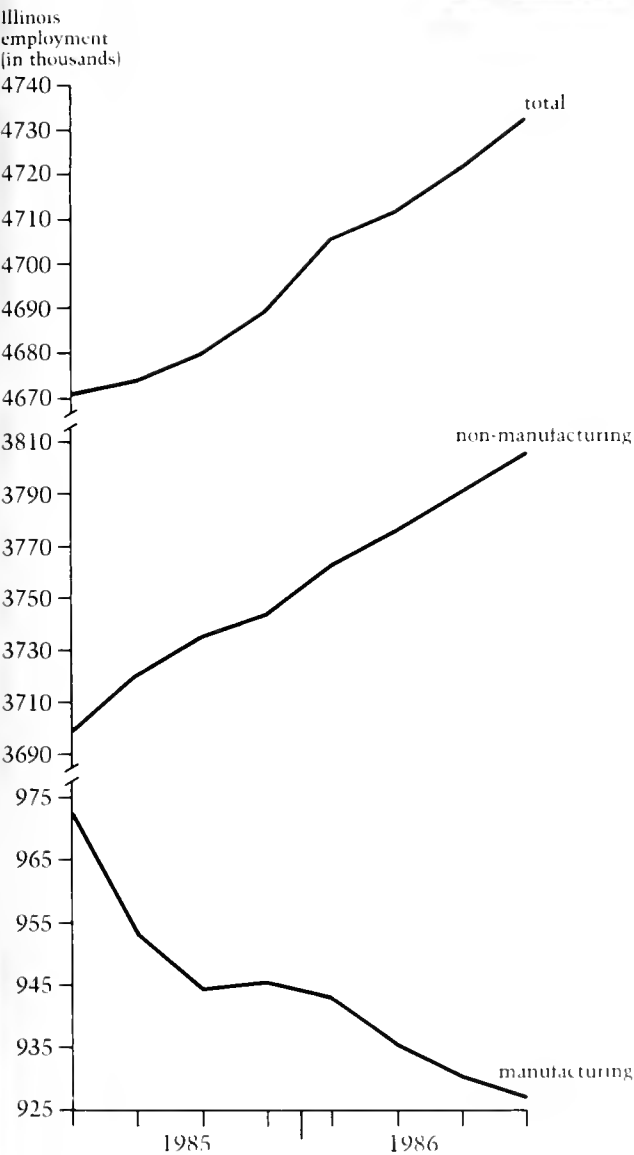
Illinois Economic Outlook

Employment in Illinois has grown since 1984 according to figures released by the Bureau of Labor Statistics, and projections from the Illinois Econometric Model indicate that this growth will continue. However, manufacturing has not shared this growth. Manufacturing lost nearly 30,000 jobs in 1985 and is projected to lose 15,000 more in 1986. A large part of this decline has been in durable goods.

As can be seen in the accompanying graph, an increase in nonmanufacturing employment has more than offset the loss. Each nonmanufacturing sector grew substantially in 1985, and the growth is projected to continue throughout 1986.

This month we are also providing comparisons of the actual estimate for the fourth quarter of 1985 with the forecasted values. Each category exhibited an error of one percent or less, with the forecast for durable-goods manufacturing being exactly correct. The model failed to predict, however, the sudden decline in service employment.

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ILLINOIS BUSINESS INDEXES

	Percent Change Jan 1985- Jan 1986	Jan 1986	Dec 1985	Nov 1985	Oct 1985	Jan 1985	Dec 1984
Coincident Indicator (1969 = 100)	4.11%	120.95	120.81	119.54	120.35	116.17	112.78
Employment-manufacturing (in thousands)[e]	−0.36%	962.8	971.1	944.6	948.3	966.3	971.0
Average weekly hours-manufacturing[e]	0.74%	40.7	41.9	41.3	40.8	40.4	39.1
Weekly earnings-manufacturing[e]	3.29%	$428.57	$442.88	$435.30	$429.62	$414.91	$402.73
Help wanted advertising-Chicago (1969 = 100)[a]	1.11%	91	104	103	96	90	107
Help wanted advertising-St. Louis (1969 = 100)[a]	35.29%	69	67	65	64	51	61
Retail Sales (in millions)[b]	4.28%	$4,553	$6,296	$5,455	$5,359	$4,366	$5,994
Coal production (in thousands)	3.43%	$5,813	4,632	4,198	5,714	5,620	4,748
Petroleum products (in thousands)[e]	−2.95%	$2,465	2,533	2,565	2,719	2,540	2,559
Vendor performance	−2.13%	46.0%	46.0%	42.0%	46.0%	47.0%	45.0%
Building permits (in thousands)							
Residential housing units	8.72%	0.997	0.950	2.751	3.316	0.917	1.086
Value of Residential housing	101.05%	$114,224	$165,595	$157,000	$211,277	$56,813	$71,393
Value of nonresidential construction							
Industrial buildings	−16.15%	$18,901	$13,340	$30,241	$34,849	$22,541	$10,800
Office, banks, and professional buildings	123.14%	$56,652	$61,950	$26,582	$74,525	$25,389	$91,400
Stores and other mercantile buildings	1.56%	$10,822	$21,667	$15,694	$35,041	$10,656	$9,834
Other	32.87%	$1,718	$4,534	$3,534	$4,502	$1,293	$1,219
Consumer price index (December 1977 = 100)							
North Central US[c]	3.29%	—	176.0	—	174.9	—	170.4
North Central/population more than 1,250,000[c]	3.58%	—	179.4	—	178.2	—	173.2
North Central/population 385,000 to 1,250,000[c]	2.96%	—	174.2	—	173.4	—	169.2
North Central/population 75,000 to 385,000[c]	3.06%	—	171.5	—	170.1	—	166.4
North Central/population less than 75,000[c]	2.98%	—	172.6	—	171.6	—	167.6
Chicago (1967 = 100)	3.55%	326.3	325.9	324.2	322.6	315.1	314.0
St. Louis (1967 = 100)	2.90%	322.4	—	321.6	—	313.3	—
		1985 III	1985 II	1985 I	1984 IV	1984 III	1984 II
Personal income (in millions)[d e]	3.09%	$165,131	$166,908	$164,894	$162,200	$160,180	$156,710
Per capita personal income[d e]	2.00%	$14,148	$14,311	$14,148	$14,024	$13,871	$13,593

[a]The Conference Board *Help Wanted Advertising*, Jan. 1986 [b]Latest month projected by BEBR [c]Percent change between December 1984 and December 1985 [d]Percent change between 1984 III and 1985 III [e]Recent month is preliminary figure

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June 1986 Illinois
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Review

DAVID MANDY AND DEBORAH MUSTELL
Cash Flows in the Illinois State Budget

Chart 2. General Fund Expenditures (Millions of Dollars)

Discussion of the fiscal position of the state government intensifies during election years as candidates articulate alternative plans for the state. The state's general fund is usually at the center of this discussion, since the general fund finances most state government operations. This article presents a flow of funds examination of the Illinois general fund since fiscal year 1971 (FY71).

General Fund Flows in FY85

The first step in charting the state's fiscal progress is to identify the sources and uses of funds in the state's general fund. Chart 1 shows the major sources of revenue for FY85. Total revenues for each category are given while numbers in parentheses represent the percent of total revenues for each category. The largest revenue categories are the sales and personal income taxes, with $3,120 million (30.2 percent) and $2,864 million (27.8 percent), respectively, in FY85. Similarly, Chart 2 depicts the chief spending categories for FY85. The largest expenditure items are public aid, common school funds, and personal services with $2,838 million (28.2 percent), $1,802 million (17.9 percent), and $1,684 million (16.7 percent), respectively, in FY85.

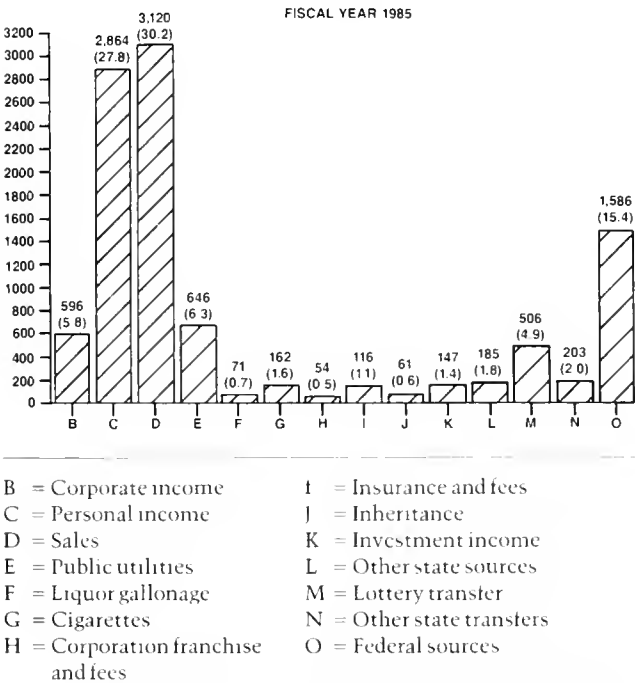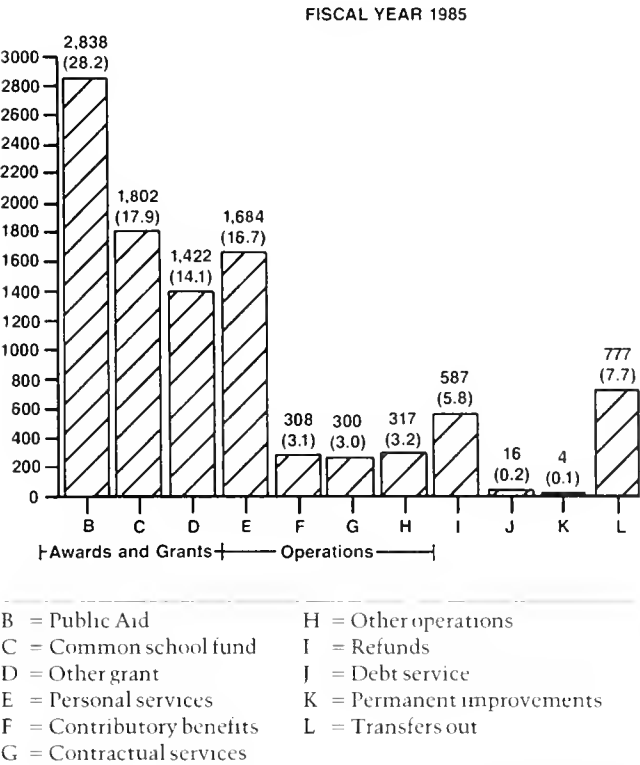## Chart 1. General Fund Revenues (Millions of Dollars)

FISCAL YEAR 1985

B = Corporate income
C = Personal income
D = Sales
E = Public utilities
F = Liquor gallonage
G = Cigarettes
H = Corporation franchise and fees
I = Insurance and fees
J = Inheritance
K = Investment income
L = Other state sources
M = Lottery transfer
N = Other state transfers
O = Federal sources

FISCAL YEAR 1985

B = Public Aid
C = Common school fund
D = Other grant
E = Personal services
F = Contributory benefits
G = Contractual services
H = Other operations
I = Refunds
J = Debt service
K = Permanent improvements
L = Transfers out

Total annual revenues and expenditures for FY 71–85 are shown in Chart 3. Since the state cannot legally operate at a deficit, the amount of any deficit is restricted to the cash on hand and the limits to the state's short-term borrowing ability. The figures discussed in this article exclude any short-term borrowing or principal payments on short-term debt. ▷

Chart 3. General Fund (Billions of Dollars)

——— REVENUES · · · · · · EXPENDITURES ------- SURPLUS
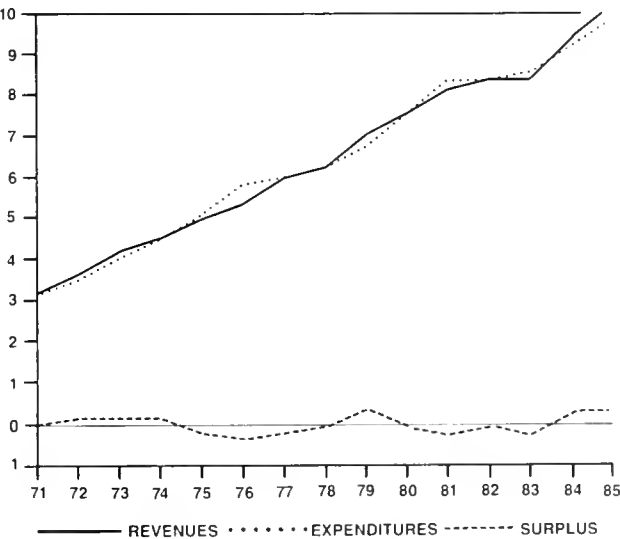
The difference between revenues and expenditures is graphed at the bottom of Chart 3. This difference is one measure of whether the state is operating a current surplus or deficit. By this measure, major surplus years occurred in FY79, FY84, and FY85, while the state experienced major deficits in FY81 and FY83.

Balanced Budget Defined

One must be cautious in discussing surpluses and deficits for the state government because there are several different definitions of the phrase "balanced budget." State Comptroller Roland W. Burris discusses these alternative definitions in the June 1985 issue of the state's *Monthly Fiscal Report.* Comptroller Burris refers to the difference between revenues and expenditures as the "available balance concept." He argues that this method is flawed because it requires the state to end the fiscal year with the same balance on hand as existed at the beginning of the fiscal year in order for the budget to be balanced, even if the beginning balance were at record high levels, as was the case at the beginning of FY86. The state is required to maintain this record-setting level of cash in order for the budget to be termed "balanced."

Comptroller Burris notes that this defect is particularly disturbing because obligations are still outstanding against any fiscal year's budget after the fiscal year ends. These obligations are called lapse-period warrants and are paid out in the lapse period, the three months following a fiscal year. Hence, the available balance measure overstates the budget position.

An alternative definition of a balanced budget, the "budgetary balance concept," that accounts for lapse-period warrants is discussed by Comptroller Burris. It defines the budget as balanced if the end-of-year balance is greater than the lapse-period warrants for that year.

The problem with this definition is that it ignores changes in end-of-year balances that may occur after lapse-period warrants are accounted for. For example, if the general funds balance were $100 million on 30 June 1984 and lapse-period warrants for July, August, and September of 1984 amounted to $40 million, then the budgetary balance after all FY84 spending is subtracted would show a surplus of $60 million. Now suppose that the general funds balance on 30 June 1985 were $150 million and that the lapse-period warrants for FY85 were $100 million. Then the budgetary balance after all FY85 spending is subtracted would be $50 million. The budget shows a surplus of $50 million for FY85 by the budgetary balance method *even though the budgetary balance after all spending is subtracted out for each year declined by $10 million.*

Whether or not this is viewed as a problem depends on the approach one takes toward the state budget. At the most basic level, the issue is whether one views the stock of funds at a point in time or the flow of funds over time as the most important indicator. The budgetary balance method argues that the balance the state has at its disposal is the important indicator of the state's fiscal health, regardless of whether the state

Chart 4.   General Fund (Millions of Dollars)

——— AVAILABLE BALANCE ------- MODIFIED AVAIL. BALANCE
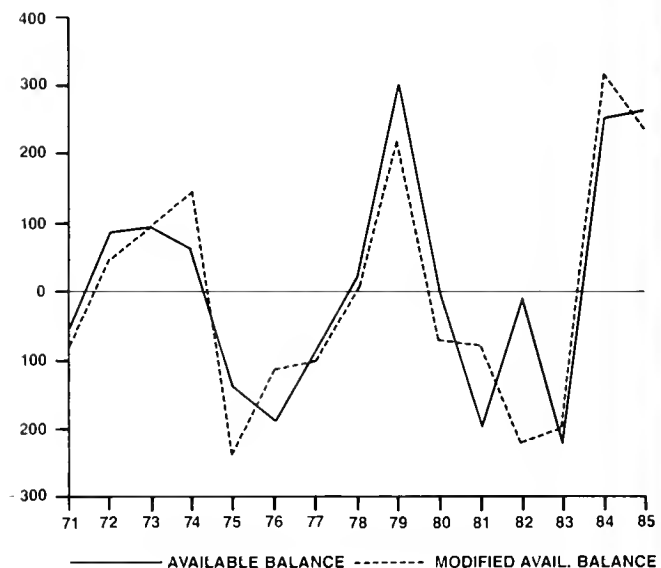
is spending more than it is collecting in taxes in any given year. Alternatively, the available balance method involves comparing revenues with expenditures in any given year. Even so, the approaches are not completely separate. The comparison of flows yields information concerning the trend in the balance the state has at its disposal.

One modification of the available balance method accounts for lapse-period warrants by comparing end-of-year balances after lapse-period warrants. Chart 4 graphs results from the "modified available balance" budget balance definition against results obtained by using the available balance definition. Chart 4 makes it clear that although the definitions differ, the figures follow each other closely. But for a given year, FY82 for example, the two quantities may differ significantly. According to this definition, the budget has been in surplus for the past two fiscal years. However, the surplus in FY85 decreases by the "modified available balance" method, while the FY85 surplus increases slightly by the available balance method. This reflects large lapse-period warrants for FY85 which offset the large year-end balance.

The outlook for FY86 is less optimistic. At this writing, the Bureau of the Budget is projecting a year-end balance of $220 million. The budgetary balance method therefore implies that if lapse-period warrants exceed $220 million the state will have incurred a deficit this year. Based on experience since FY78, it is unlikely that lapse-period warrants will be this low. By the available balance method, the $220 million prediction is also pessimistic, since it falls $259 million short of last year's $479 million year-end balance. Similarly, the modified available balance method predicts that lapse-period spending must fall below $176 million in order for the budget to be balanced. ▷

4

Real Budget Flows

Revenues and expenditures in 1967 dollars are depicted in Chart 5. Here, the surplus year of FY79 is clearly evident. The effects of the recession in the early 1980s are also dramatically illustrated, as real revenues and expenditures plunged over 15 percent. The sharp increase in real revenues in FY84, accompanied by a similar increase in real expenditures, was a result of the temporary increase in income tax rates and the permanent increase in the sales tax rate enacted by the legislature.

Chart 5. General Fund (Billions of Constant Dollars)

REVENUES ·········· EXPENDITURES
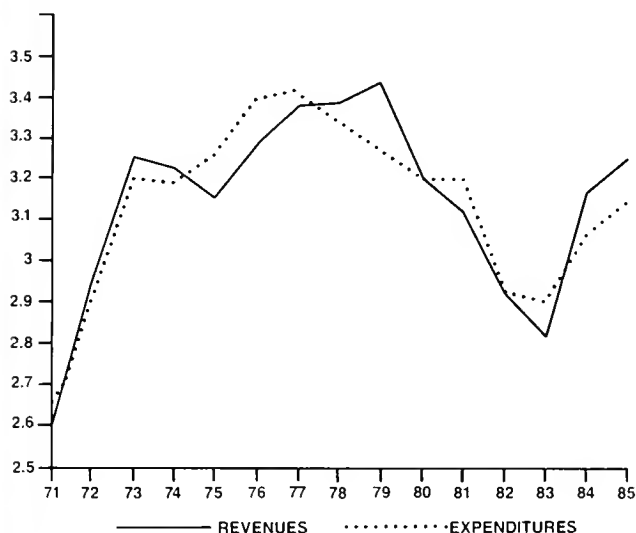
On 1 July 1983, the personal income tax withholding rate was increased from 2.5 to 3.5 percent and the corporate income tax rate was increased from 4 to 5.6 percent. Then, on 1 January 1984, the personal income tax rate was changed to 3.0 percent and the corporate income tax rate to 4.8 percent. On 1 July 1984, these rates returned to 2.5 and 4 percent, respectively. Further, the sales and use taxes on food and drugs were reduced in steps from 4 percent to 0 over the period from 1 January 1984, and the tax on other taxable items was increased from 4 to 5 percent on 1 January 1984. Only with these increases did the state return to a surplus. The slower growth in FY85 reflects the expiration of the income tax increases, even though real revenues continued to increase in FY85 due to the gradual recovery of the Illinois economy. ▲

The data used to construct Charts 1-5 were provided by the Comptroller's Office, State of Illinois.

MARIANNE FERBER

An Ancient Solution to a Modern Problem: The Procrustean Approach

In the February issue of the *Illinois Business Review* the question was asked "Is Unemployment a Labor Supply Problem?" In brief, the author argues that "if the labor force had not grown as fast as it did, the unemployment level would now be much lower."

It is of course true that there has been a substantial increase in the size of the labor force, and it is further correct that this is primarily so because of the rapid influx of women into the labor market. But if unemployment were simply caused by the existence of a larger labor force, how would one explain the far higher unemployment rates in the 1930s, when the labor force was far smaller and when, incidentally, the vast majority of women were full-time homemakers?

The problem with this approach is that it applies micro analysis, which assumes that as one variable changes everything else remains the same, to the labor market as a whole, where this is entirely unrealistic. Does anyone really believe that demand for goods and services, and hence the demand for labor, would be the same if labor force participation were equal to that in 1950?

There is also a second question that needs to be raised. Mr. White objects to the view of unemployment as a sign of not enough jobs to go around, and suggests that it may just as readily be seen as a case of too many people wanting jobs. In this instance, he is technically correct. But is there a substantive case to be made that when people need or want to work it is just as acceptable simply to tell them that there is no place for them, no opportunity for them to be self-supporting, productive members of society, as it is to make an effort to improve the functioning of the economy? This is a view that would have appealed to Procrustes, the mythical king who stretched short visitors, and cut off the limbs of tall ones, in order to have them fit the size of his bed.

Marianne Ferber is a professor of Economics and former director of the Office of Women's Studies, University of Illinois at Urbana-Champaign.

Real Estate Developments: Recent Trends in Homeownership

Chart 1. Homeownership Rates for All Households 1974–1985

It currently appears that, for the first time in five decades, the homeownership rate at the end of this decade will be lower than at the beginning. As of 1985, the overall national rate was 63.9 percent, compared with the rate of 65.6 percent in 1980 (see Chart 1). The current rate is a new low for the decade, despite renewed economic growth and interest rates as low as in 1980. Moreover, this decline comes in the face of demographic trends that would have raised the national average over the period in the absence of other shifts. Why has this decline occurred? Is it general or is it focused among certain groups? Will it be reversed by the recent decline in interest rates? These are important questions from a social perspective as well as a matter of concern to real estate professionals. This article reviews the available data on these and related issues. The conclusion here is that the decline in those choosing to own is primarily a response to a major increase in the relative cost of owning versus renting. The decline has been concentrated among younger, married households. In fact, recent ownership rates among these households are very similar to those of the early 1970s, when homeownership was also expensive relative to renting. However, the trend probably will be reversed by the most recent drop in interest rates.

The Cost of Owning versus Renting

To understand the recent decline in homeownership, one must look back almost 10 years. In the late 1970s, there was a surprising upward trend in homeownership rates at a time of rising nominal interest rates. The explanation seemed to be that housing had become an investment, that is, expected price appreciation was being incorporated into the decision to become a homeowner. The expectation of house price appreciation due to inflation was more than offsetting the rise in interest rates due to inflation. In addition,
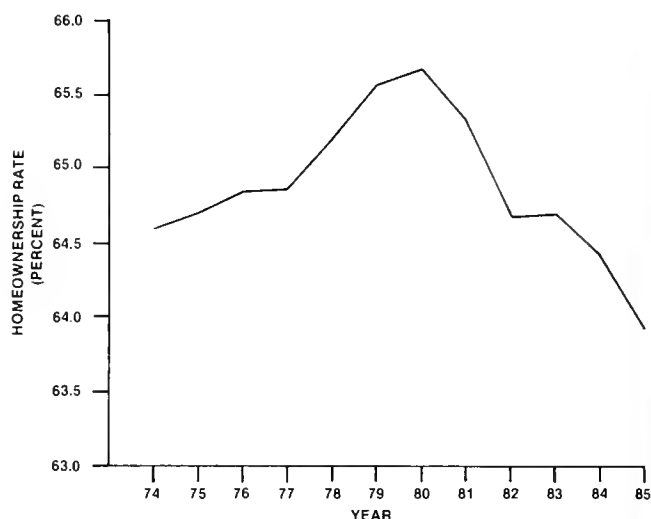
homeowner tax considerations were also being enhanced by inflation. Inflation was pushing people into higher tax brackets. It also made homeownership a better tax shelter. Although expectations of inflation presumably pushed up interest rates, the increase was currently deductible. The related increase in appreciation was essentially tax exempt. Thus, the tax advantages of owner-occupied housing rose with higher levels of expected inflation. (Inflation also operates to make rental housing a better tax shelter at higher inflation rates. However, such an effect takes time to translate into lower rents. Meanwhile, households decide on ownership based on comparing current rents with what they think their net cost of ownership will be.)
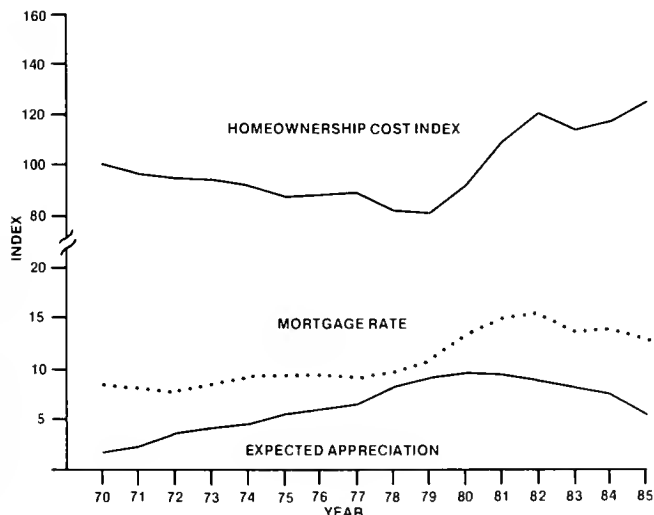
Researchers have calculated several time-series on the after-tax, inflation-adjusted cost of homeownership. One such series is shown in Chart 2. As with most of the other series, there is a downward trend from 1970 to 1978–1979 in the true cost of ownership, both because of tax advantages and because nominal interest rates lagged the rise of inflation. (I concluded that the major impact derived from a decline in real, before-tax interest rates and not from the expected impact of inflation on the tax advantages). There followed a major jump in cost between 1979 and 1982, as nominal (and real) interest rates rose rapidly. In particular, the average effective rate on fixed-rate mortgages closed in 1982 was 15.33 percent, up by over 40 percent from the 10.92 percent in 1979.

This upward shift in ownership costs was widely recognized at the time, so the immediate decline in homeownership was no surprise. This decline was accelerated by the particularly high rates of unemployment among the younger households who would have been the first-time home buyers. What is

less generally recognized, however, is that the estimated cost of homeownership has remained (until recently) in the same range as it was in 1982, despite the decline of almost 3 percentage points in nominal interest rates. This result reflects four years of remarkably slow appreciation in nominal house prices, an average of 2.8 percent through 1985. Since the formula used here assumes that people forecast future appreciation by looking at recent appreciation, the decline in actual appreciation has set in motion a steady decline in expected appreciation that has matched the drop in the nominal interest rate, leaving a real interest rate in 1985 at about the same level as in 1982 (see Chart 2).

Presumably, homeownership depends on the relative cost of owning and renting, not just the cost of owning. However, the net trend in the ratio of estimated ownership costs to a series on adjusted gross rents (Chart 3) is only slightly different from the trend in ownership costs alone. A steady decline in relative ownership costs after 1970 terminated in 1978 and rapidly reversed itself from 1979 to 1982. Our initial estimates for 1985 are not much different from the 1982 peak. The conclusion stands that ownership in 1985

was probably less attractive than at any time since 1970.

The continued high relative cost of owning, taken by itself, is enough reason for the generally lagging behavior of overall ownership rates. However, there are many further insights to be gained by breaking out the population into a number of demographic and socioeconomic components. These insights both confirm and embellish the basic story and reveal much about how individuals in different circumstances respond to a major shift in the cost of renting versus owning.

Chart 3. Ratio of Homeownership Costs to Adjusted Gross Rents, 1970–1985 (1970 = 100)

Adjusted Gross Rent is Residential Rent, as defined by the Bureau of Labor Statistics, plus utilities and other tenant paid items plus an adjustment for depreciation, deflated by the GNP personal consumption deflator. For an explanation of the adjustment, see Ira S. Lowry, "Inflation Indexes for Rental Housing," RAND Corporation, Santa Monica, California, 1981.

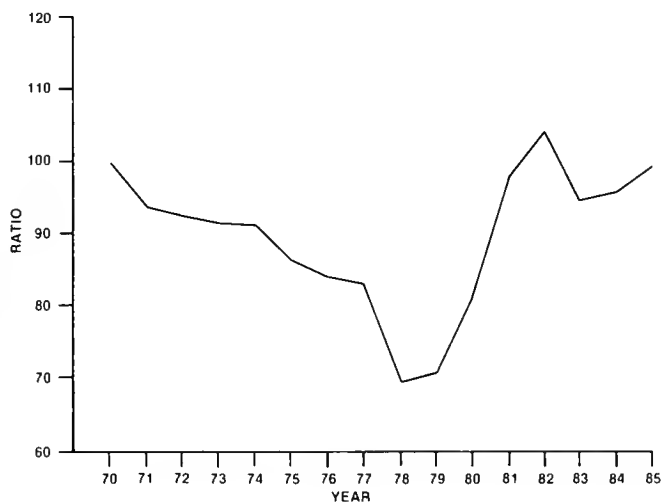## Chart 2. Real After-Tax Cost of Homeownership 1970–1985 (1970 = 100)

Note that in this chart the before-tax real interest rate in 1985 was about the same as in 1970. Net ownership costs are higher than in 1970, primarily because of higher house prices and operating costs.

Homeownership Trends by Age.

The most dramatic difference in the way different socioeconomic and demographic groups have responded to the rise in ownership costs is across age levels. This difference is to be expected for a number of reasons. In particular, young households are more likely to rent and thus have not established any commitment to owning. They are also more likely to move and thus be faced with an immediate choice in the matter of ownership. For example, about 34 percent of all households with heads aged 25–29 moved in 1983, compared with 8 percent of households with heads between 55 and 59.

Data on ownership by age for 1981–1985 from the Housing Vacancy Survey (HVS), matched with data for 1974 to 1980 from the Annual Housing Survey, confirm

Chart 4. Homeownership Rates for Married Couple Households, 1974–1985.
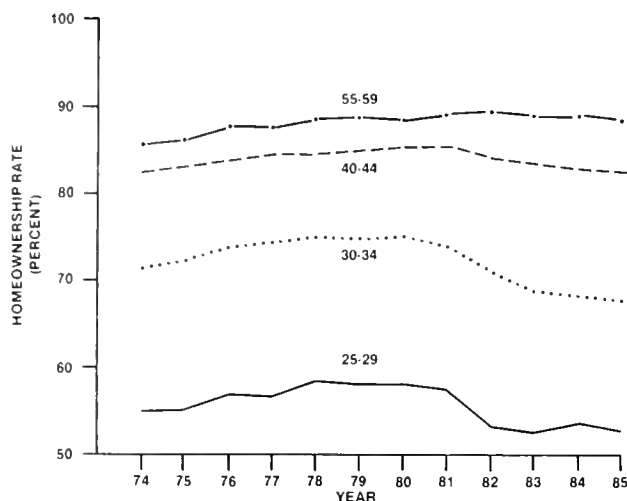
this adjustment pattern. We have smoothed the quarterly data from the HVS by using annual averages. Chart 4 shows the trend in these ownership rates for married couples in selected age groups. We have held constant the marital status because it is a separate major determinant of the ownership decision.

The homeownership rates for married couples with heads aged 25–29 and 30–34 showed steep declines of 4 and 6 percentage points, respectively, between 1979 and 1985. Over the same period, the households with heads age 55–59 showed a small increase in ownership.

Trends by Marital Status.

We have focused on the ownership rate of married couples broken into five-year age groups. This is essential for the period under analysis because there was a major shift in the marital composition of several age groups. Since nonmarried households at each age level have lower rates than married households, the shift towards more nonmarried households would have reduced the age-specific ownership rates even in the absence of a drop in ownership propensity for a given type of household.

Having separated out the nonmarrieds, we find that the age-specific rates for nonmarried households rose or fell very little. Why the divergence in reaction by marrieds and nonmarrieds? In fact, since the nonmarrieds have a higher mobility rate than marrieds, they should respond to a change in tenure price more sharply and swiftly. Moreover, the rate actually increased for some age groups over part or all of the period. This unusual pattern may be due to two other considerations. First, the ownership rates of the nonmarrieds has risen very rapidly in the 1970s, and this rise was carried over into the following age groups as the cohort aged into that group. Secondly, there seemed to be a sociological redefinition of single status at both younger and older ages. At the younger age

groups, the one-person female households tended to show the most upward trend, presumably reflecting shifts towards a career orientation and an expectation of a longer, perhaps permanent, duration of the single status. At older age groups, for example, age 50–54, both male and female singles tended to show increases in ownership, perhaps also because of a shift in the perception of the status as permanent.

Future Prospects.

In 1985, the real interest rate and homeowner costs were approximately as high as in 1982, yet ownership had continued in a downward trend. The continued downward trend presumably reflected the lags in households adjusting to the sudden changes. However, in 1986, interest rates have fallen sharply, probably more than have expectations of house price appreciation. At the same time, the upward trend in real rents has continued, despite the high rates of new rental construction in many markets. Thus, homeownership should appear relatively more attractive in 1986.

These shifts should at least stabilize the age-specific, marital-specific ownership rates. In that case, the long-term upward trend in the overall rate should reassert itself, simply because the baby boom generation is aging into the high ownership years. As that aging proceeds, the overall ownership rate will inexorably rise towards 70 percent or higher. However, the peaks in ownership by younger households reached in the late 1970s may not be surpassed any time soon.

Douglas B. Diamond is a Senior Policy Analyst at the National Association of Home Builders.

New Publication

Last October the Office of Real Estate Research in cooperation with Lambda Alpha International sponsored a conference on the Impact of Tax Reform Proposals on Real Estate Investment. A volume based upon papers presented at the conference is now available. Tax Reform and Real Estate, *edited by James R. Follain, is published by The Urban Institute Press. Copies can be obtained by writing to: Urban Institute Press, 2100 M Street, NW, Washington, D.C. 20037 or by by calling 202/857 8718.*
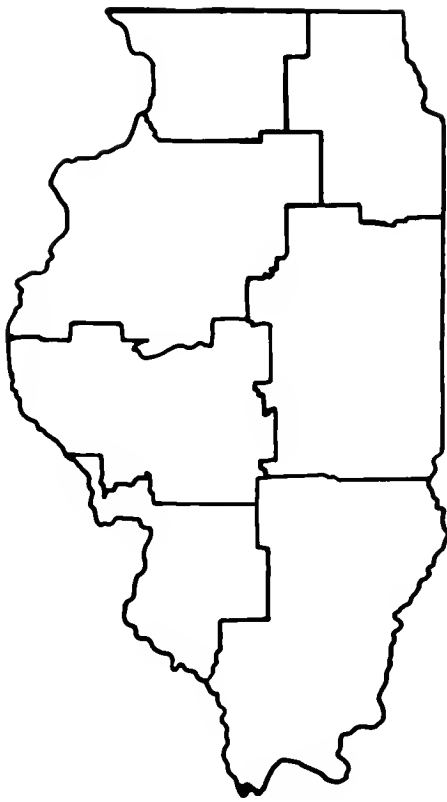
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Build Illinois: A Regional Impact Analysis

As a master plan for economic development, "Build Illinois" has been launched to meet the needs of an economy that experienced significant growth in high tech and service industries in recent years. Of the five areas of the program considered to be of crucial importance, housing and infrastructure are expected to receive 43 percent and 33 percent of the 2.3 billion dollar total, with the remainder allocated to education, business, and the environment.

The program is expected to affect the economy significantly in terms of growth and job creation. In addition to statewide growth, it is also imperative from a policy perspective to assess the effects of the program on different regions of the state. Differences in the structure of regional economies will cause regions to respond differently to investments in particular sectors. Hence, an investigation into the impact of specific activities on a regional economy would allow planners and policymakers to place regional and sectoral emphasis in proper perspective.

This article presents the results of an input-output study on the probable effects of the "Build Illinois" program on different regions of the state. The study is based on single-region input-output models that do not consider interactions between regions. The models, however, account for leakages out of the regional economic system and, therefore, do not result in overestimation of gross output changes.

Illinois Regions

The Department of Commerce and Community Affairs has divided the state of Illinois into seven subregions on the basis of the commuting patterns

within the state. These regions are shown in the Map. Tables 1–3 show some regional economic indicators for those regions. In terms of population, Region 2 (Chicago region) ranks first with almost seven and half million people, and it accounts for about 64.5 percent of the total population of the state. Region 3 (north central Illinois) is the only other region that has a population of over a million (8.76 percent). All other regions combined account for about 27 percent of the state population.

The Chicago region's employment is slightly less than its share. While 64.5 percent of state total population lives in this region, only 62.9 percent of employed persons live there. At the same time, the Chicago region accounts for about 70 percent of the total manufacturing employment in the state. The manufacturing base of Region 1 (northwestern Illinois) is also quite strong, as is evident from the percentage of manufacturing employment. Although this region ranks seventh in terms of population and sixth in terms of total employment, it ranks third in terms of manufacturing employment. Regions 2 (north central Illinois), 4 (east central Illinois), and 5 (west central Illinois) are characterized by a proportionately larger number of employed persons, while Regions 6 (southwestern Illinois) and 7 (southeastern Illinois) have less total and manufacturing employment than their share by population of the state.

In terms of per capita income as well, Chicago is the leading region in the state, with about 104 percent of the per capita income for the state. In all other regions, per capita income is well below the state average and varies between 71.5 and 87 percent of the state average with the exception of Region 7, which has the lowest per capita income in the state ($4,696).

Table 1. Employment by Regions (1985)

Region	Manufacturing Employment	Percent of State Total	Rank	Total Employment	Percent of State Total	Rank
1	70,410	6.80	3	230,467	5.03	6
2	719,505	69.52	1	2,876,605	62.86	1
3	95,213	9.12	2	426,099	9.31	2
4	58,247	5.63	4	352,965	7.71	3
5	24,164	2.33	7	238,949	5.22	4
6	37,974	3.67	5	234,552	5.12	5
7	29,420	2.84	6	216,676	4.73	7

Source: Illinois Department of Commerce and Community Affairs

Table 2. Population by Regions (1985)

Region	Population	Percent of State Population	Rank
1	520,605	4.49	7
2	7,466,079	64.44	1
3	1,015,355	8.76	2
4	811,068	7.00	3
5	527,551	4.55	6
6	651,576	5.62	4
7	592,672	5.12	5

Source: Illinois Department of Commerce and Community Affairs

Table 3. Regional Per Capita Income (1985)

Region	Per Capita Income	Percent of State Average	Rank
1	5,383	82.00	4
2	6,816	103.80	1
3	5,654	86.13	3
4	5,318	81.02	6
5	5,709	86.97	2
6	5,373	81.85	5
7	4,696	71.54	7
State Average	6,564	100.00	—

Source: Illinois Department of Commerce and Community Affairs

Regional and Sectoral Effects of the Build Illinois Program

To examine the eventual impact of different types of government expenditures under the "Build Illinois" program, we have performed some simulations. In these simulations, four major sectors of the program: housing, infrastructure, education, and business in each region were perturbed. The amount of money allocated to each of these sectors under the program was distributed among different regions on the basis of either population or manufacturing employment. In particular, housing, infrastructure, and education investments have been distributed on the basis of population while business investments have been distributed on the basis of employment. Direct effects here refer to initial output dollars from various sectors needed to satisfy the set of direct expenditures. The extra output needed to satisfy these direct demand changes will require inputs from other sectors, which, in turn, will require further inputs and so on. Thus, the total effects are greater than the direct effect. The indirect effect is the difference between total and direct effects.

Table 4 shows the impacts of the program on different regions. Impacts on output, employment, and income are greatest in the Chicago region, where the total increase in output is about 160 percent of the initial increase (direct effect) while the total increases in employment and income are 225 percent and 171 percent of the initial increases. Thus, the region has an output multiplier of 1.60 and employment and income multipliers of 2.25 and 1.71. The Chicago region is followed by west central Illinois. Although west central Illinois has the lowest level of manufacturing employment in the state, it is second only to the Chicago region in per capita income. This may partially explain the high value of multipliers in this region compared to other regions. Northwestern Illinois has the lowest output, employment, and income multipliers indicating that it has relatively lower capability for generating economic growth.

Since six of the seven regions are small and do not compare favorably with Chicago, we have grouped them together into one region and calculated the impacts on this basis. The results indicate that Chicago is still the leading region although the differences have narrowed. Thus, the output, employment, and income multipliers for the rest of Illinois are 1.506, 2.018, and 1.587 as against 1.60, 2.25, and 1.71 for Chicago. Because of higher productivity levels and higher concentrations of economic activity, the Chicago region will benefit most if the expenditures of the "Build Illinois" program are based on population and employment distribution. The impact in terms of increases in outputs, employment, and income in the rest of Illinois would be lower, although large variations can be expected across the component regions.

A policy designed to achieve a particular objective must be based on careful analysis. Since policies are often designed to affect specific sectors, it is appropriate to determine the impact of output, employment, and

Table 4. Program Impact: Output, Employment, and Income Multipliers

Region	Output Multiplier	Employment Multiplier	Income Multiplier
1	1.334	1.811	1.421
2	1.593	2.251	1.710
3	1.453	2.069	1.558
4	1.460	1.999	1.571
5	1.522	2.118	1.630
6	1.400	1.918	1.485
7	1.446	1.889	1.532
Rest of Illinois*	1.506	2.018	1.587

*Includes all regions except Chicago.
Source: Illinois Department of Commerce and Community Affairs

income multipliers on various sectors to evaluate these policies. We have attempted to analyze the spatial variations in sectoral multipliers. Such analyses are helpful in providing policy guidelines for tackling spatial imbalances in development.

Table 5 represents output multipliers associated with each sector. For each region, the output multipliers corresponding to housing and business appear to be quite similar. Infrastructure, however, has a relatively higher output multiplier in each of the regions. The difference is highest in the Chicago region where housing and business have output multipliers of about 1.55, while infrastructure has an output multiplier of 1.67. Interregional differences in output multipliers for each of the sectors are also observed. Chicago has the highest output multipliers in housing, infrastructure, and business, while northwestern Illinois has the lowest output multipliers in these sectors. The analysis indicates investments in infrastructure are likely to generate more total output than investment in housing or business when considered separately. The location of such investment is also important. Northwestern Illinois appears to be the least productive region while the Chicago region appears to be the most productive.

Table 5. Output Multipliers

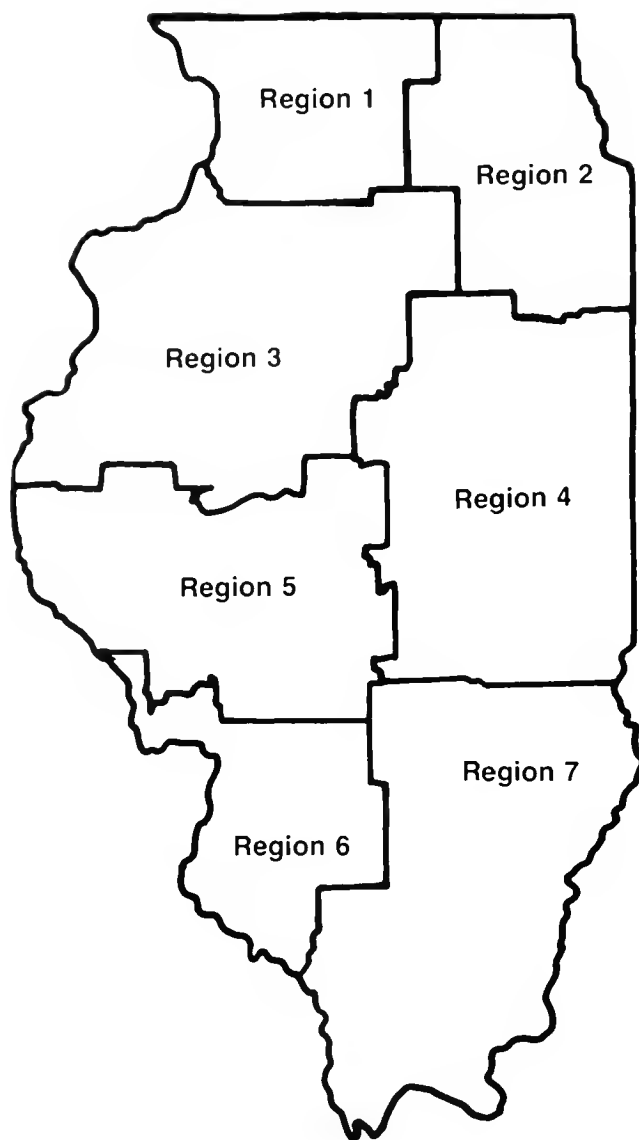| Region	Housing	Infrastructure	Business
1	1.310	1.376	1.309
2	1.549	1.670	1.549
3	1.413	1.523	1.412
4	1.421	1.528	1.418
5	1.482	1.582	1.484
6	2.360	1.464	1.361
7	1.416	1.502	1.407

Table 6 gives employment multipliers for each sector and region. It is interesting to note that employment multipliers associated with infrastructure are less than employment multipliers associated with housing or business. Thus, the effects of housing and business sectors on labor-intensive industries are larger than the effects of infrastructure on these industries. Interregional comparisons indicate that, as before, the Chicago region has the highest employment multipliers while northwestern Illinois has the lowest in all the sectors. Interregional variations in employment multipliers are, however, greater than the interregional variations in output multipliers.

Intersectoral and interregional comparisons of income multipliers reveal the same patterns as for employment. Table 7 shows that the income multiplier for infrastructure is lower than that for housing or business. Chicago, again, is the leading region followed by west central Illinois.

Table 8 shows the output, employment, and income multipliers for the non-Chicago regions when they are combined into a single region. When Chicago is compared to this "region," we observe less interregional variation in sectoral multipliers. In housing for example, the output multiplier for the rest of Illinois is about 1.46 compared to 1.55 for Chicago. For five out of six regions comprising the rest of Illinois, the output multiplier is less than 1.46. Similar observations can be made for employment and income.

As the analysis illustrates, the size of a region is very important for analytical purposes. If the objective is to concentrate investments in a small region, selecting a larger region as the unit of analysis would be inappropriate as it would give misleading information about the effects of such investments. The economic

Table 6. Employment Multipliers

Region	Housing	Infrastructure	Business
1	2.069	1.614	2.048
2	2.488	2.032	2.452
3	2.342	1.838	2.363
4	2.237	1.812	2.220
5	2.407	1.893	2.390
6	2.125	1.745	2.147
7	2.082	1.718	2.083

Table 7. Income Multipliers

Region	Housing	Infrastructure	Business
1	1.654	1.276	1.641
2	2.077	1.475	2.054
3	1.839	1.380	1.833
4	1.875	1.387	1.855
5	2.010	1.422	1.996
6	1.740	1.334	1.737
7	1.827	1.351	1.818

Table 8. Sectoral Multipliers for the Rest of Illinois

Multipliers	Housing	Infrastructure	Business
Output Multipliers	1.462	1.581	1.463
Employment Multipliers	2.245	1.823	2.235
Income Multipliers	1.871	1.403	1.853

structure of a region and its relationships with the outside world are also of crucial importance. Analyses for regions similar in size but different in economic structures will yield different results. For example, northwestern Illinois and west central Illinois are very close in terms of population size but the output, employment, and income multipliers associated with west central Illinois are larger than the multipliers associated with northwestern Illinois. Appropriate regionalization is, therefore, a prerequisite for spatial analysis of development programs.

Policy Implications

Our results indicate that the effects of a particular policy vary not only across sectors but also across regions. The main point this study emphasizes is that the locational aspects of government expenditure should be given due consideration. It has been observed that the regions of the state differ greatly in terms of population, employment, and income. The results show that the effects of government expenditures on output, employment, and income in different regions vary significantly. In the Chicago region, for example, each dollar of direct government expenditure indirectly generates 1.59 dollars. In northwestern Illinois, on the other hand, 1.33 dollars would be created indirectly for each dollar of output created directly. The critical question, therefore, is what criteria should be used for distributing government expenditures among different regions.

Calculation of sectoral multipliers in different regions is a useful way of evaluating policies in terms of attaining specific economic objectives. Our study indicates that some sectors exert more influence on employment than others. There is also regional variation. In a region with a lower level of employment, such sectors may be given more emphasis. If the objective is to increase per capita income more rapidly, then sectors that have larger income and output multipliers may be appropriate targets.

The present study is based on single-region input-output models that do not account for interactions between and among different regions. In reality, of course, regional economies are highly dependent on each other. An interregional input-output model is, therefore, a better representation of an economic system. The use of such models will be helpful in tracing the eventual effects of a program on all regions, the sum of which will be greater than the sum of the regional effects calculated in isolation.

Sound policies and programs should stem from a rigorous conceptual framework. Since the "Build Illinois" program envisages large expenditures across a wide variety of industries in the state, careful studies of alternative expenditures are crucial for the program to generate maximum benefits. These studies must concern the implications of sectoral and regional impact of different policies.

Comprehensive and rigorous analyses are required to understand the complex interactions within and among economic regions in order to allocate scarce resources effectively. Models that quantify the complex interdependencies in a regional economic system provide information that can now be used to provide much-needed policy guidelines for the spatial distribution of development expenditures. ▲

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Illinois Business Indexes

Beginning in this issue, each *Illinois Business Review* will publish several graphs of relevant Illinois data series. The data graphed will be obtained from data series currently published in the Illinois Business Indexes table. However, unlike the table, the graphs will include an entire year of each data series. The Illinois Business Indexes table will continue to be published. The presentation of Illinois data series in graphical form is intended to allow readers the opportunity to easily follow economic trends and cycles.

In this issue, six graphs are presented. The coincident indicator is a composite of other Illinois economic indicators. Manufacturing accounts for a large percentage of Illinois employment. Both manufacturing employment and average weekly earnings for manufacturing employees is included. Help Wanted Indexes for Chicago and St. Louis are included. Help wanted indexes allow comparisons of job opportunities to be made between different time periods. Estimates for Illinois' retail sales are also included.
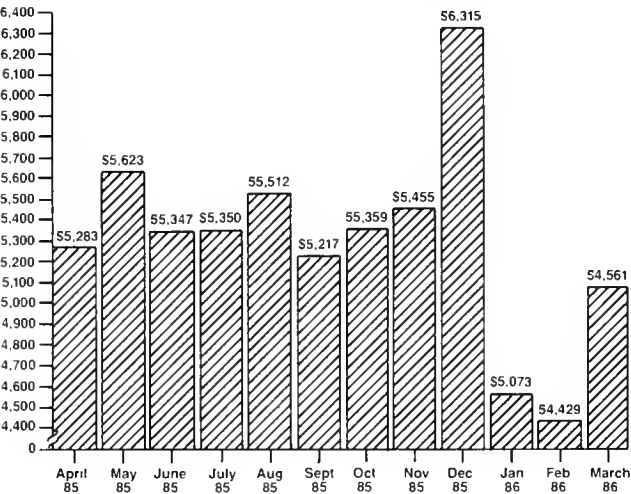
ILLINOIS BUSINESS INDEXES

	Percent Change March 1985– March 1986	March 1986	Feb 1986	Jan 1986	Dec 1985	March 1985	Feb 1985
Coincident indicator (1969 = 100)	4.72%	119.04	119.80	120.95	120.81	113.67	112.16
Employment-manufacturing (in thousands)ᶜ	0.64%	966.5	964.9	962.8	971.1	960.4	964.3
Average weekly hours-manufacturingᶜ	0.74%	40.6	40.1	40.7	41.9	40.3	39.6
Weekly earnings-manufacturingᶜ	3.78%	$430.36	$422.65	$428.57	$442.88	$414.69	$407.09
Help wanted advertising-Chicago (1969 = 100)ᵃ	–4.08%	94	93	91	104	98	100
Help wanted advertising-St. Louis (1969 = 100)ᵃ	–5.41%	70	70	69	67	74	72
Retail sales (in millions)ᵇ	4.58%	$5,073	$4,429	$4,561	$6,315	$4,851	$4,312
Coal production (in thousands of tons)	4.32%	5,485	5,309	5,813	4,632	5,258	5,098
Petroleum products (in thousands of barrels)ᶜ	43.01%	3,232	2,707	2,758	2,533	2,260	2,040
Vendor performanceᵍ	8.70%	50.0%	48.0%	46.0%	46.0%	46.0%	48.0%
Building permits							
Residential housing units (in thousands)	–7.19%	2.247	1.009	0.997	0.950	2.421	1.282
Value of residential housing	39.85%	$204,774	$111,698	$114,224	$165,595	$146,420	$70,824
Value of nonresidential construction							
Industrial buildings	–8.96%	$21,632	$20,295	$18,901	$13,340	$23,761	$4,367
Office, banks, and professional buildings	–87.56%	$8,196	$38,003	$56,652	$61,950	$65,906	$44,259
Stores and other mercantile buildings	146.29%	$38,386	$17,452	$10,822	$21,667	$15,586	$12,466
Other	–70.76%	$1,282	$1,693	$1,718	$4,534	$4,384	$1,318
Consumer price index (December 1977 = 100)							
North Central USᶜ	2.45%	—	175.4	—	176.0	—	171.2
North Central/population more than 1,250,000ᶜ	2.81%	—	179.2	—	179.4	—	174.3
North Central/population 385,000 to 1,250,000ᶜ	2.36%	—	173.7	—	174.2	—	169.7
North Central/population 75,000 to 385,000ᶜ	2.22%	—	170.4	—	171.5	—	166.7
North Central/population less than 75,000ᶜ	1.49%	—	170.7	—	172.6	—	168.2
Chicago (1967 = 100)	2.05%	323.9	326.4	326.3	325.9	317.4	316.7
St. Louis (1967 = 100)	1.56%	319.2	—	322.4	—	314.3	—

		1985:IV	1985:III	1985:II	1985:I	1984:IV	1984:III
Personal income (in millions)ᵈ ᶜ ᶠ	4.36%	$169,265	$165,131	$166,908	$164,894	$162,200	$160,180
Per capita personal incomeᵈ ᶜ ᶠ	3.34%	$14,492	$14,148	$14,311	$14,148	$14,024	$13,871

ᵃThe Conference Board, *Help Wanted Advertising* March 1986. ᵇLatest month projected by BEBR. ᶜPercent change between February 1985 and February 1986. ᵈPercent change between 1984:IV and 1985:IV. ᶜRecent month is preliminary figure. ᶠSeasonally adjusted at annual rates. ᵍPercentage of companies receiving slower deliveries
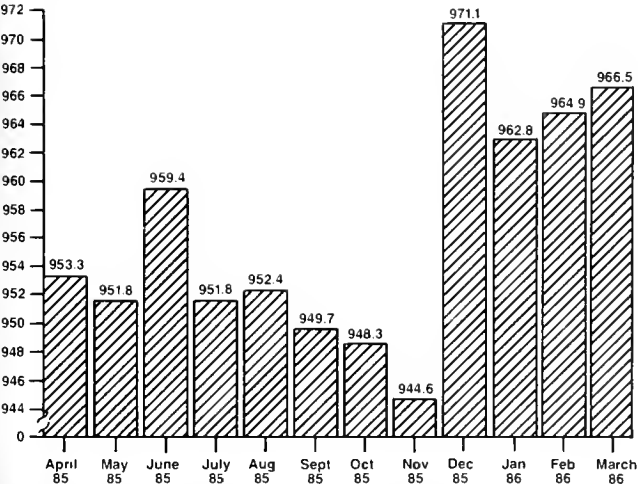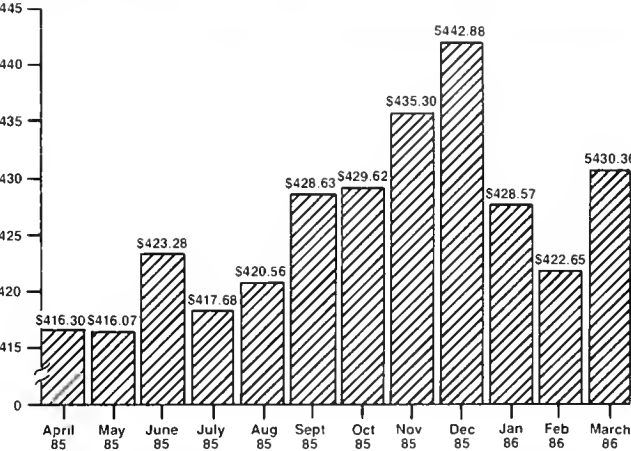
Coincident Indicator (1969 = 100)

April 85	May 85	June 85	July 85	Aug 85	Sept 85	Oct 85	Nov 85	Dec 85	Jan 86	Feb 86	March 86
122.29	123.96	122.80	122.39	125.21	126.68	120.35	119.54	120.81	120.95	119.80	119.04

Retail Sales (in millions)

April 85	May 85	June 85	July 85	Aug 85	Sept 85	Oct 85	Nov 85	Dec 85	Jan 86	Feb 86	March 86
$5,283	$5,623	55,347	$5,350	55,512	$5,217	55,359	$5,455	$6,315	$5,073	54,429	54,561

Employment, manufacturing (in thousands)

April 85	May 85	June 85	July 85	Aug 85	Sept 85	Oct 85	Nov 85	Dec 85	Jan 86	Feb 86	March 86
953.3	951.8	959.4	951.8	952.4	949.7	948.3	944.6	971.1	962.8	964.9	966.5

Average Weekly Earnings, Manufacturing

April 85	May 85	June 85	July 85	Aug 85	Sept 85	Oct 85	Nov 85	Dec 85	Jan 86	Feb 86	March 86
$416.30	$416.07	$423.28	$417.68	$420.56	$428.63	$429.62	$435.30	5442.88	$428.57	$422.65	5430.36

Help Wanted Advertising–St. Louis (1969 = 100)

Source The Conference Board *Help Wanted Advertising*

April 85	May 85	June 85	July 85	Aug 85	Sept 85	Oct 85	Nov 85	Dec 85	Jan 86	Feb 86	March 86
64	64	73	67	65	67	64	65	67	69	70	70

Help Wanted Advertising–Chicago (1969 = 100)

Source The Conference Board *Help Wanted Advertising*

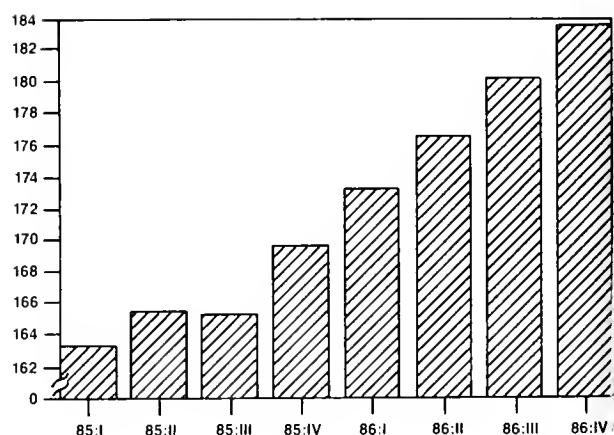| April 85	May 85	June 85	July 85	Aug 85	Sept 85	Oct 85	Nov 85	Dec 85	Jan 86	Feb 86	March 86
94	96	99	101	98	95	96	103	104	91	93	94

Illinois Business Review

Illinois Economic Outlook

Illinois Personal Income (Millions of Dollars, Seasonally Adjusted Annual Rates) 1985 and Forecasts for 1986.

	(1)	(2)	(3)	85 I	85 II	85:III	85:IV	86:I	86:II	86:III	86:IV
Total	165,756	169,625	2.28	163,275	165,481	165,219	169,625	173,206	176,442	180,110	183,465
Total, Private											
Nonagricultural	102,246	102,608	3.53	98,829	100,020	101,053	102,608	103,896	105,163	106,833	108,428
Mining	1,176	1,103	−6.62	1,163	1,172	1,129	1,103	1,116	1,116	1,121	1,125
Construction	6,183	5,917	−4.50	5,736	5,971	5,967	5,917	6,116	6,253	6,390	6,500
Manufacturing	28,428	29,087	2.27	28,708	28,579	28,149	29,087	29,386	29,692	30,018	30,264
Nondurable Goods	10,633	10,873	2.21	10,682	10,637	10,633	10,873	10,967	11,120	11,253	11,398
Durable Goods	17,795	18,214	2.30	18,026	17,942	17,516	18,214	18,419	18,571	18,765	18,860
Transportations and											
Utilities	9,876	9,916	0.40	9,341	9,493	9,868	9,916	10,011	10,030	10,111	10,204
Wholesale Trade	9,928	10,116	1.86	9,830	9,903	9,993	10,116	10,278	10,460	10,650	10,840
Retail Trade	10,611	10,563	−0.45	10,202	10,341	10,612	10,563	10,711	10,867	11,018	11,167
Finance	9,671	9,792	1.24	9,236	9,403	9,516	9,792	9,990	10,100	10,305	10,514
Services	26,371	25,785	−2.27	24,310	24,839	25,503	25,785	26,289	26,645	27,220	27,808

(1) — Last Forecast For 1985-IV (2) — Historical Value For 1985-IV (3) — Percentage Error In Forecast

Illinois personal income grew 2.7% in the fourth quarter of 1985, according to figures released by the Bureau of Economic Analysis. For the entire year, it grew 5.2%. The sectors with the largest growth were transportation & utilities and services. The Illinois Econometric Model performed well in terms of personal income for the fourth quarter of 1985. The overall forecasting error was 2.28% (an underestimation), with the only large error being mining (6.6%) and construction (4.5%). The model also predicts continued personal income growth of 7% for 1986.

Illinois Personal Income 1985–1986 (Seasonally Adjusted Annual Rates)

Illinois
Business

Review

MARVIN FRANKEL

Regulating Noise from Illinois Airports

Over the past 10 to 20 years the environmental problem of noise—from industrial machinery, motor vehicles, aircraft and a host of miscellaneous sources has gained increasing attention. In responding to one segment of this problem, the Illinois Attorney General in February 1977 proposed to the state's Pollution Control Board a plan to regulate and limit noise emissions from the state's public airports. Consistent with its responsibilities under the Illinois Environmental Protection Act, the Board initiated a series of public hearings, and the Department of Energy and Natural Resources sponsored technical and economic studies of probable impact. Over a six-year period (1977 to 1983), the Board held a series of 43 hearings (two additional hearings to update the record were held last September). As might be expected, attitudes toward the proposed regulation of the various affected parties differed. It was generally opposed by the Air Transport Association, the Illinois Public Airports Association, and the Department of Aviation of the City of Chicago, and was generally supported by the Illinois Environmental Protection Agency and by officials and citizens groups in the suburban communities surrounding O'Hare Airport.

In April 1986, some nine years after the Attorney General's initial overture, the Board produced a proposed regulation. As presently drawn, it provides for the phasing in of progressively tighter noise standards. Beginning 1 January 1988 the maximum permissable level of noise emissions from operations at a public airport to any Class A or residential land would be 80 L_{dn}. This would decline to 75 L_{dn} on 1 April 1989 and to 65 L_{dn} on 1 October 1994. The L_{dn} measure, to be calculated as an annual average, is a weighted average of daytime and nighttime (10:00 p.m. to 7:00 a.m.) noise levels and incorporates a penalty for nighttime noise, which is generally found to be more disturbing. A 65 L_{dn} noise level has come to be widely recognized and accepted as the maximum level compatible with the ordinary activities of people in residential areas.

Besides this basic provision, the regulation would prohibit the construction of a new runway at an airport if it would create a noise level greater than 65 L_{dn} on any class A land. In addition, airports are required to prepare, through use of a designated Federal Aviation Agency computer model, noise exposure maps showing the noise contours for the airport and such other data as airport boundaries and runways, aircraft flight tracks, surrounding land uses, and estimates of the number of dwelling units and persons located within each of the several contours. Airports with jet operations are also

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required to maintain records of the data needed to generate the airport's noise contours and to report the data quarterly to the Illinois Environmental Protection Agency.

There are two circumstances either of which would relieve the airport proprietor of the obligation to meet the noise standards: first, if non-Class A land subject to excess noise is converted to Class A status subsequent to the preparation and filing of the airport's noise exposure map; second, if the airport proprietor has secured a noise easement on Class A land with noise levels in excess of 65 L_{dn}. However, this exception does not apply to noise levels of 75 L_{dn} or greater. The proprietor of an airport in violation, or contemplated violation, may also petition for a so-called adjusted standard that would allow a higher noise level for some specific period of time. The petition procedure is rather elaborate and requires, among other things, discussion and assessment by the airport proprietor of a variety of possible methods for reducing noise, the presentation of a plan for reducing the airport's noise impact, and a schedule for implementing the various elements of the plan.

The Noise Status of Illinois Airports

There are more than 100 public airports in the State of Illinois. The technical and economic study (henceforth Economic Study)[1] carried out in 1980–81 to assess the impact of the proposed noise regulation found that 14 of these airports would be in violation. These airports are identified in the Table, along with estimates of the number of residential dwellings located in the designated noise intervals (see the base case column). All of the airports accommodate jet aircraft. For Vermillion County, Galesburg, Quincy, Waukegan, the number of such operations is quite modest, while for others (Rockford, Peoria, Moline-Quad City, Midway, O'Hare) it ranges from substantial to very large. In all cases, these operations contribute critically to the elevated noise levels. Indeed, the airport noise problem, in Illinois and elsewhere, is essentially a jet noise problem.

The Table indicates that statewide approximately 97,000 dwellings are affected by noise levels in excess of 65 L_{dn}, and about 5,200 of these experience noise levels of more than 75 L_{dn}. The most serious problems downstate in terms of dwellings affected are at the Moline-Quad City and Peoria facilities. For some of the other downstate airports, such as Champaign-Willard, Danville-Vermillion County, Galesburg, and Quincy, the number of affected dwellings is small. The core of the problem lies at the two Chicago airports. The O'Hare and Midway environs combined contain just over 98 percent of the total housing units over 65 L_{dn}, with O'Hare alone representing 89 percent. Virtually all housing units over 75 L_{dn} are located at these two airports. This is not surprising. In downstate areas, with low population and extensive open land, the forces that pack people and housing close to airports are much weaker than in the crowded, land-short areas in and around a major city.

The figures in the Table are based largely on data developed or available around 1980. The O'Hare figures are an exception and relate to 1984. The Noise Abatement Office at O'Hare reports that between 1979 and 1984 the 65 L_{dn} contour has contracted, with the number of dwelling units subjected to noise levels in excess of 65 L_{dn} declining by about 17 percent to the total in the Table of 86,400. It attributes the improvement to the changing composition of the air carrier fleet and, specifically, to the introduction of more modern, quieter aircraft and the retirement of some of the older, noisier vehicles. Since 1980, at other airports, various changes may well have occurred in the volume of traffic, in the types of aircraft arriving and departing, in traffic patterns, in the balance between day and night operations, and in the development of residential land. Such changes could, of course, affect the numbers of dwellings subject to high noise levels. At Midway airport, the number of air carrier operations (though not total operations) has increased over the past several years, and the relative importance of jet operations apparently has increased. Hence, the 65 L_{dn} contour may have grown. Accordingly, it should be understood that the figures in the Table may not give an accurate indication of the current status of individual airports. At the same time, the general impression of the extent of the noise problem in the state and of its relative importance at different locations remains reasonably reliable.

The Adverse Effects of Noise

Noise as a pollutant, depending on its type and intensity, can produce various effects on people. In the case of airport noise, the main effects are recognized to be speech and sleep interference and annoyance. The type of noise emanating from airports is typically variable and intermittent, rather than steady and continuous. As an aircraft passes overhead, the peak noise on some properties adjacent to the airport might average 90–95 dBA outdoors, or 70–75 indoors, rising to this peak as the aircraft approaches and diminishing as it moves away. With each flight, the noise pattern is repeated. For a given residence or group of residences, flyovers are generally irregular in the course of a day, with one or more peak periods and intervals of low activity. There may also be considerable variation because of shifting wind conditions. Such variation may also occur because of efforts by the airport tower to limit the noise impact on a given residential sector. The resulting L_{dn} measure averages the noise levels over the high or peak periods and the moderate and quieter periods.

The noise levels caused by aircraft flyovers disrupts speech and other types of communication. At 90–95 dBA outdoors, speech may be all but impossible for 10 to 20 seconds, and at 70–75 dBA indoors it may be difficult to talk for 5 to 10 seconds. With each flyover, the situation is repeated. In testimony at public hearings before the Pollution Control Board, numerous citizens living near airports complained of difficulty conversing with family members, hearing their

televisions or stereos, and using their telephones. Communications problems arise also for institutions such as churches, hospitals, and schools located near airports. In schools, classroom instruction may be impaired or completely interrupted for 5 to 30 seconds with each flyover. At an airport like O'Hare, depending on wind direction and traffic, such flyovers may occur every minute or two and may continue for a few or even several hours. The O'Hare Noise Abatement Office reports that as of 1984, 93 schools were located within the 65 L_{dn} contour.

Status of Residential Dwellings at Selected Illinois Airports

| | No. of Dwellings in Noise Zone | |
Airport	Base Case	With Modified Operating Procedures
Champaign-Willard		
70-75 L_{dn}	5	NA[c]
65-70 L_{dn}	12	NA
Danville-Vermillion County		
70-75 L_{dn}	0	NA
65-70 L_{dn}	10	NA
Decatur Municipal		
70-75 L_{dn}	6	0
65-70 L_{dn}	142	44
Galesburg		
70-75 L_{dn}	0	NA
65-70 L_{dn}	3	NA
Moline-Quad City		
Over 75 L_{dn}	2	2
70-75 L_{dn}	66	49
65-70 L_{dn}	1,530[a]	177
Mt. Vernon		
70-75 L_{dn}	0	NA
65-70 L_{dn}	40	NA
Peoria		
70-75 L_{dn}	40	2
65-70 L_{dn}	581	252
Quincy		
70-75 L_{dn}	0	NA
65-70 L_{dn}	1	NA
Rockford		
Over 75 L_{dn}	2	NA
70-75 L_{dn}	14	NA
65-70 L_{dn}	9	NA
Springfield-Capital		
70-75 L_{dn}	2	0
65-70 L_{dn}	34	17
Waukegan		
70-75 L_{dn}	0	NA
65-70 L_{dn}	54	NA
West Chicago-DuPage County		
70-75 L_{dn}	9	NA
65-70 L_{dn}	15	NA
Chicago-Midway		
Over 75 L_{dn}	2,000	NA
65-75 L_{dn}	6,000	NA
Chicago-O'Hare		
Over 75 L_{dn}	3,213	[b]
65-75 L_{dn}	83,187	[b]
All Non-Chicago Airports		
Total	2,577	717
Over 75 L_{dn}	4	4
Midway and O'Hare		
Total	94,400	[b]
Over 75 L_{dn}	5,213	

Sources: Base Case column—for the non-Chicago airports, including West-Chicago DuPage County, data are from Table II–1, pp 5–6, Vol. II of the *Economic Study*. Data for Midway Airport are from the 1977 Master Plan study for that airport. Data for O'Hare Airport are from the 1984 Annual Report of the O'Hare Noise Abatement Office, with the breakdown between the noise zones estimated by the author. Modified Operating Procedures column—Table II–3 and II–4, pp 22 and 25, Vol. II of the *Economic Study*

[a] A substantial number of these dwellings are mobile homes
[b] Modified operating procedures are not yet established at O'Hare (see text)
[c] NA = Not Applicable.

Even lower noise levels also disturb sleep. Noise from passing aircraft may either awaken an individual or cause a change in his sleep level, affecting the quality as well as quantity of sleep. While many people can adapt their sleep to repeated noise exposures, the adaptation is only partial. The frequency of awakening may be reduced, but there is little or no adjustment to disturbances in sleep level. The probability of sleep disturbance and the severity of disturbance increase as aircraft passbys increase in number and noise levels. In general, outdoor noise levels of 45 dBA with windows open and 55–60 dBA with windows closed are considered adequate for uninterrupted sleep. As the noise increases, adverse effects set in. There is greater sensitivity to aircraft noise, and other types of noise as well, in the otherwise quiet late hours, and especially when sleep is disturbed. This accounts for the 10 dBA penalty that is incorporated into the L_{dn} measure for flights occurring between 10:00 p.m. and 7:00 a.m. The occasional night operations at some downstate Illinois airports generate peak sound levels that are well above the disturbance thresholds noted above. At O'Hare Airport, which accommodates a greater number of night flights, the problem is more severe.

Annoyance is a psychological response to a given noise exposure. It may result from speech or sleep interference, but it can arise in a variety of other circumstances. The perceived unpleasantness of the noise is a factor in annoyance, as is any anxiety or apprehension that the noise might cause. In studies done with jet noise, one of the factors adding significantly to people's annoyance was their implicit fear of a plane crash. Other factors influencing the degree of annoyance are the frequency and duration of the noise, the time of day that it occurs, its informational content, and the background noise against which a particular noise occurs. A person's attitude toward the noise source can also be important. For example, an airline or airport employee who sees air travel as a source of employment and economic security may experience less annoyance in a given circumstance than, say, an employee of a library subject to overflights. Noise levels need not be high to cause annoyance. Levels of 50–55 L_{dn}, well below those set in the proposed regulation, will cause annoyance to a nominal fraction of the population.

Medical research has established that high noise levels can produce a number of physiological effects of consequence, including hearing loss, cardiovascular stress, blurred vision, colitis, and migraine headaches. Such noise levels can also aggravate existing physical and mental health problems. While the state of research in this area remains unsettled in certain respects, it seems generally to be agreed that the noise levels around airports are not sufficiently high to produce these sorts of effects, at least not to an extent that warrants public concern. The present, predominant view of the burdens imposed by aircraft noise is much

the same as that expressed in a 1976 FAA statement on noise abatement policy:

> Aircraft noise disturbs the normal activities of airport neighbors—their conversation, sleep, and relaxation—and degrades their quality of life. Depending on the use of land contiguous to an airport, noise may also affect education, health services, and other public activities.
>
> Although there may be indirect and subtle social and psychological harms, aircraft noise is predominantly an annoyance problem. It does not present any direct physical health danger to the vast majority of people exposed (quoted in the Pollution Control Board's Proposed Opinion and Order, p. 71).

As a corollary it may be noted, that in contrast to many other pollutants, the effects of noise are transient and noncumulative. Once the source is removed, there are no lasting impairments.

The Rights, Wrongs, and Complexities of Airport Noise

Situations of environmental pollution are commonly thought of as involving two parties, transgressors (polluters) and victims. The latter are seen to suffer burdens imposed by the extra-legal or improper actions of the former, and are accordingly entitled to relief. The case of airport noise is more complicated.

An airport requires a large amount of flat, open land. Large expanses of land are ordinarily available only at the edge, or some distance from, built-up areas. Thus, when first constructed, an airport may have little or no housing nearby, and the noise impact from its operations is small or negligible. Over time, the airport may grow through physical expansion and an increase in the number of aircraft operations. Concurrently, people who seek housing, and the real estate developers who serve them, are drawn to locations around the airport. They are attracted by some of the same factors that earlier attracted the airport—vacant land and good drainage. They are attracted also by the supplies of water and power that have become available, by good access to road and air transportation, and by the economic activity that the airport supports and generates. The airport and residential land thus become juxtaposed, making conflict all but inevitable.

The introduction in 1958 of the commercial jet transport, with its substantially increased requirements for acoustical space, greatly intensified the opportunities for conflict and increased the scale that conflict might attain. Land proximate to the larger airports began to experience significantly elevated noise levels, and land that earlier had seemed distant from the airport became subject to disturbing noise levels. Increasing numbers of households found that, whereas their residential surroundings previously had been relatively quiet, they now were subject to noisy overflights.

Interestingly, the initiation and expansion of jet traffic seemed not to inhibit residential development around airports. The Pollution Control Board, in issuing its recent opinion and order on the proposed regulation, cited a number of examples of this phenomenon that

had been reported during the lengthy series of hearings. In Bensenville, a suburban community bordering O'Hare, the population grew 40 percent from 1960 to 1970, while in nearby Wood Dale the population rose over 175 percent in the same period. In several other townships in the area, over 500 single-family dwellings were built between 1970 and 1978, and over 800 multiple family units were constructed on land with noise levels of 75 L_{dn} or greater. The airport manager for Springfield Capital reported that the airport authority had objected to 12 cases of zoning near the airport and had lost all of them. Other instances of close-in incompatible development were reported for the Quad Cities and Decatur airports. These examples highlight the fact that control of zoning for residential development and control of the airport and its development rest with different jurisdictions.

Midway Airport presents a sharply contrasting situation to those just cited, with changing aircraft technology playing the central role. The neighborhoods surrounding the airport were well-established prior to 1960, with less than 15 percent of the housing in the area being built after that date. The noise from propeller-driven aircraft was not regarded as a serious problem. The introduction of jet aircraft raised noise levels very substantially, and areas previously comparatively quiet became subject to significant noise. At certain other airports, simple airport expansion has produced a similar result. The extension of a runway or addition of a new runway, possibly accompanied by increases in traffic, has altered noise contours, bringing higher noise levels to existing residential areas. The conflict between airport users and nearby residents thus results from the intermixture of several forces. Many of those living in noise-affected dwellings moved to those dwellings after the airport and its noise patterns were established. Some were attracted by new residential developments whose location was ill-conceived and improperly controlled. Others purchased existing properties as they came up for resale. In both cases, one might reasonably suppose that the purchasers had some awareness of the nearby airport and its noise. In contrast, others living near an airport may be fairly regarded as victims of factors beyond their control, such as changes in aircraft types or expansion of the airport and its activities.

Neighborhood amenities such as good schools, good roads, good police services, and attractive nearby parks tend to be capitalized into property values. So also do neighborhood disamenities. Thus, one expects a property enjoying one or more such amenities to be worth more, other things equal, than a similar property without them. By this reckoning, a residential property burdened by a noise level of, say, 75 L_{dn} should be worth less than a similar property experiencing only 70 L_{dn} and still less than one subject to 60 L_{dn}. Many economic studies have been made of the relation between aircraft noise and residential property values. While the results are not definitive, they suggest, on the average, about a 0.6 percent decline in property value per decibel increase in the noise level. The discount represents

compensation for the future noise burden a buyer expects to bear. Alternatively, the same .6 percent per decibel, if paid to the existing occupants, would effectively compensate them, in present value terms, for the future noise burden they would carry. It is important to bear in mind that from an economic point of view, appropriate compensation to the bearer of an environmental burden is, for that person, equivalent to the elimination of that burden through some suitable means of abatement. In either case, the individual has been "made whole" by being restored to his prepollution level of satisfaction. Against this backdrop, we can classify noise-affected households into four broad groups. First, there are homeowners who came to their locations when these locations were quiet, either because no airport yet existed or because the scope of its operations was limited, and who later became subject to aircraft noise. Second, there are former homeowners, in all aspects like the preceding group, except that subsequent to the introduction of aircraft noise they sold their homes, accepting the markets discounted value, and moved elsewhere. Both of these groups are, in a meaningful sense, true victims of noise pollution. Third, there are homeowners presently resident in the noise-affected area who purchased their dwellings at a discount from the second of the above groups. Fourth, there are the occupants of rental property in the noise-affected area who, because of the noise, pay lower rents for their units than the market would otherwise require. Since both of these latter groups are compensated for their noise burdens, neither can properly be viewed as a victim. Renters, it might further be noted, are a mobile and transient group. Since the average renter remains in a given location for a comparatively short period, his noise exposure tends to be limited.

A final point on property valuation deserves mention. To the extent that airport noise is reduced, other things remaining unchanged, the values of properties surrounding the airport should rise. But it does not follow from this that the elimination of the airport would be favorable to the value of these same properties. The reverse would doubtless result in many cases. Airports are focuses of economic activity. The income they generate, the employment opportunities they provide, and the transportation access they afford all help to support and enhance the property values of nearby communities. We do not know the magnitude of this positive force, but it surely helps to compensate for, and in some instances may more than offset, the losses due to noise. The goal of abatement obviously must be to control and limit the effects of noise without impairing value-generating airport activities.

Methods of Abatement and Their Implications

There are several methods for reducing aircraft noise or mitigating its impact. First, a noisy aircraft may be replaced with a later generation, quieter machine, or its engines may be replaced or retrofitted to reduce noise. Second, the manner of operating the aircraft may be modified. Within limits, its landing and departure

profiles can be changed and selected runways can be used so as to reduce noise emissions to residential properties. Third, sound-absorbing earthen berms can be strategically placed on an airport to reduce the transmission of engine testing and run-up noise. Fourth, actions that directly involve the noise receivers can be taken. Dwellings can be insulated to reduce noise pass-through, noise emission rights can be purchased from homeowners, and clear areas can be established by purchasing and converting or demolishing residential structures in high noise areas. Finally, the activity level of an airport can be reduced. Night flights, which carry a penalty in the L_{dn} noise measure, can be reduced or eliminated, and the number of day flights can be restricted.

More than a decade ago, the Federal Aviation Administration prescribed noise standards to be met by the air carrier fleet and future dates for achieving compliance. Under those standards, the fleet has gradually become quieter as new generation aircraft have been introduced and older aircraft retired or retrofitted with quieter engines. At present, close to 90 percent of the US fleet has achieved what is called Stage II compliance, and movement continues toward the eventual attainment of Stage III compliance.

Opportunities for application of the remaining abatement methods depend on the conditions at individual airports. Some of these methods are of relatively low cost, while others are more expensive. Changes in aircraft operating methods are generally low cost and, in some conditions, can yield substantial reductions in noise levels. The purchase of noise emission rights, or easements, can entail significant costs, depending upon the number of dwellings involved. Such easements may cost from 2.5 percent to perhaps 17 percent of property value, depending upon the noise status of the property. The noise insulation of dwellings is yet more expensive, with the cost, like easements, also varying with the noise status of the airport. The Economic Study put the average cost of insulating a noise-affected dwelling at a downstate airport at $3,300, compared to an average easement cost of $1,500. The cost of property acquisition and demolition, with properties being purchased at their market values, is of course much higher than either of these approaches. Cutbacks in the volume of operations generate complex repercussions, and the costs are not easily estimated. But such cutbacks are implicitly very expensive since, depending on their type and extent, they disrupt and otherwise compromise the air transportation system.

The Economic Study found for the non-Chicago airports that changes in aircraft operating procedures— the use of preferential runways, modest changes in climb profiles after takeoff, and adjustments in traffic patterns for arrival and departure—would be applicable at Decatur, Peoria, Moline-Quad City and Springfield. These changes would reduce the total of dwellings at the non-Chicago airports subject to more than 65 L_{dn} by over 70 percent, from 2,575 to 717. The outcome is summarized in the third column of the Table. Overall,

for the 12 airports, the remaining problem is nominal. Over half of the housing over 65 L_{dn} is concentrated at two airports, Peoria and Moline-Quad City, with the balance scattered among the other 10 facilities. Compliance with respect to these dwellings might be achieved by any of the several methods discussed earlier. The least costly would be the purchase of noise easements. Alternatively, some combination of easements and noise insulation might be used, though at somewhat higher cost. Insulation, it should be noted, is only a partial remedy, since it has no effect on outdoor noise levels. Moreover, it is not clear from the proposed regulation that this approach would constitute an acceptable method of compliance. The regulation, it should also be noted, provides that easements are not an acceptable method of compliance for properties subject to noise levels of 75 L_{dn} or more. For those properties, acquisition by the airport authority would presumably be necessary. It is easy to make a case, on economic grounds, that this provision lacks a rational basis.

The near-term noise problem at downstate Illinois airports appears manageable through the application of one or more of the mitigation methods described, though in certain instances the airport authorities may need to request an exemption from the noise limits (as described later). But a longer-term problem will remain. Jet traffic at some airports will grow over the coming years, pushing up the noise level, though this force will be offset in some degree through a changing fleet mix that incorporates quieter aircraft. More important, in the absence of countervailing policy, residential development around airports, including development within moderate and even high noise zones, can be expected to continue. The result will be an intensification of present effects or the undoing of favorable effects from any abatement measures that may have been taken. The proposed regulation requires that the proprietors of airports in violation of the standards make good faith efforts to persuade local zoning authorities to prevent development on existing or prospective noise-sensitive lands, and this could have beneficial consequences. Further, an airport proprietor is exempt from violation if non-Class A land is converted to Class A or residential land subsequent to disclosure, through publication of a noise contour map, of the noise level on that land.

The situation at the Chicago airports, both for the near and the longer term, is less tractable. O'Hare airport, the busiest such facility in the world, in 1985 supported about 750,000 operations, of which about 12 percent were at night. Over 75 percent of these operations are by large air carrier-type aircraft, and over 95 percent of them are by jet aircraft. About 86,000 housing units are presently contained within the 65 L_{dn} contour. The Economic Study suggested that modified day and night operating procedures could, by themselves, bring about a substantial shrinkage in the noise-affected area and in the number of affected housing units. The feasibility of these changes remains to be tested in O'Hare's complex operating environ-

ment. Meanwhile, in 1984 the airport tested a set of modified procedures for nighttime operations, involving the use of preferential runways and preferential flight paths intended to direct more departing aircraft over nonresidential areas. The results have not yet been published, but it appears that the procedures successfully reduced the size of the 75 L_{dn} contour but not the 65 L_{dn} contour. The airport has also undertaken and partially completed a program of constructing noise-attenuating earth berms at strategic locations around the airport, and it has underway a program for assessing alternative procedures for noise abatement during aircraft departures. These steps will doubtless achieve a measure of success, but will still leave perhaps 50 to 60 thousand dwelling units within the 65 L_{dn} contour. As was indicated for the downstate airports, the least costly method of treating the remaining dwellings would be through the purchase of noise easements. The cost for those dwelling units in the 65–75 L_{dn} interval might run in the neighborhood of \$100 million to \$120 million. The remaining dwellings might be noise-insulated at appreciably higher per unit costs (and without any assurance that this action would bring compliance), for an outlay of perhaps \$75–\$85 million. These costs might be defrayed over, say, a five-year period through an increase in landing fees charged to airlines or by passenger ticket surcharges. An alternative approach for the estimated 3,200 dwellings located above 75 L_{dn} would be their purchase by the airport authority. This approach would be expensive, carrying an aggregate cost of perhaps \$235 million. This cost might be reduced somewhat through redevelopment of at least some of the acquired land. However, from an economic vantage point, property acquisition even with allowance for a redevelopment offset, is difficult to justify.

Midway airport currently supports about 190,000 operations per year, or about one-quarter of the number of its neighbor to the north. The opportunities for noise abatement at the airport are unfortunately limited by its size or compactness, its geography and its constrained pattern of operations, with residential properties around it to the east, west, and north and, with a gap, to the south. Because of this residential pattern and restrictions arising from runway lengths, there is little opportunity for noise abatement through the kinds of operational changes considered for O'Hare. The mitigation options that remain are the relatively expensive ones of easements, insulation, and property acquisition. Thus, despite the lesser scale of Midway's noise problem, the obstacles to achieving compliance appear fully as great as those at O'Hare. The problem could grow in the future since the 1984 master plan study for the airport projects significantly enlarged noise contours for 1995.

In its discussion of the proposed regulation, the Pollution Control Board refers to the noise problems at O'Hare and Midway as "massive" and recognizes that a solution is not attainable in the short run. It appears to acknowledge the limited reach of its own powers, as

well as the powers of airport proprietors, in the following comment:

> This Board by itself cannot solve the noise problem. Units of federal, state, and local government as well as the courts, industry, the real estate industry, developers, proprietors, and potential buyers and sellers of homes must all participate to some extent if progress is to be forthcoming. For its part, the Board will establish a noise standard for public airports and require that certain information be made available to the public. This action will make a small, but hopefully significant, dent in a very large problem. The authority and ability to zone around airports, develop and purchase quieter aircraft, alter flight operations, and educate the public about potential noise problems rests with other entities (*Proposed Opinion and Order,* pp. 115-16.)

In anticipation of compliance difficulties, the Board provides in the regulation, as previously noted, for an adjusted standard that might be sought by an airport unable to meet the prescribed noise limits. It is certain that the two Chicago airports will apply for such a standard, and it is probable that several non-Chicago airports will do the same. It is also virtually certain, based on events to date, that the power of the Board to adopt the regulation will be challenged in the courts and that subsequent enforcement actions for violations will be similarly challenged. Hence litigation is in prospect for the coming years. Finally, at the political level, the recent controversy over a proposed regional airport authority for the Chicago area appears destined to continue.

[1]*Economic Impact of Proposed Noise Regulations,* R77-4, Illinois Institute of Natural Resources (subsequently the Department of Energy and Natural Resources), 1981, in four volumes. Volume 1, *Technical Study of Public Airports Outside Chicago,* by Paul Schomer, R. W. Findley, and Marvin Frankel; Volume 2, *Economic Analysis of Public Airports Outside Chicago,* by Marvin Frankel and Lise Zwisler; Volume 3, *Technical Study of O'Hare and Midway Airports,* by Paul Schomer; Volume 4, *Economic Analysis of O'Hare and Midway Airports,* by Marvin Frankel and Lise Zwisler.

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ARTHUR GETIS

Economic Well-Being among Chicago's Suburbs

Between 1970 and 1980 the city of Chicago lost over 150,000 manufacturing jobs. During the same period over 300,000 people left the city. This outmigration is comparable in absolute terms to the volume of inmigration around the turn of the century. Contrary to the views expressed in the popular press, however, the vast majority of those people migrated not to the Sunbelt but to Chicago's suburbs. Taking into account the natural increase in population, the suburbs overall have grown in population at a slightly slower rate than the city has declined. The migration to Chicago's 200 suburbs, however, has been uneven. Now after 20 years of large-scale outward movement, the result is about 30 burgeoning suburbs, with the remainder equally divided among no-growth and declining municipalities.

In this article, a shortened version of a longer, more technical research paper to be published in *Economic Geography* late in 1986, I will show that growth is associated with the favorable economic health of suburban municipalities and that geographic patterns of well-being imply that poor community health spreads like a communicable disease. In addition, I will present two rankings of municipal economic well-being that are used to compare the quality of the current economic environment and the recent trends in economic health for 183 suburban communities for which adequate data are available.

Because of our reliance on census data, we must restrict our study to the period ending 1980. The enormous amount of economic activity in the vicinity of Oak Brook since 1980 is not considered in this study.

One can discern at least two types of unhealthy communities: (1) those with unfavorable levels of important socioeconomic variables (such as low per capita income and high crime rates) and whose trends in those variables are either stagnant or negative; and (2) those communities that are better off in key variables but whose recent trends are unfavorable. The healthiest communities have advantageous and improving levels in such key variables as employment, unemployment, persons below the poverty level, and bond rating. The view taken here is that economic health is best viewed as a function of recent trends in key variables, except if communities are so well off that there is "nowhere to go," or if current levels are so depressed that even a modest positive trend can do little

to improve economic well-being.

Before developing a model of economic health, we analyzed the relationship between 21 variables for 39 of the largest municipalities in the Chicago Standard Metropolitan Statistical Area (SMSA). The main purpose was to attempt to identify the motive variables, that is, the variables that generate trends in other variables, but that are not generally subject to feedback effects from the variables they affect (exogenous variables). We identified two such variables: change in unemployment and change in employment. Another purpose was to find the appropriate response variables, that is, those variables that best reflect the effects of explanatory variables such as the exogenous variables. With the use of correlation analysis and factor analysis, the main response variable—the current proportion of the population below the poverty level—was chosen as the best indicator of economic well-being. Chart 1 depicts the series of relationships.

Chart 1. Causal Structure for Municipalities in the Chicago SMSA Showing Statistically Significant Paths between Variables
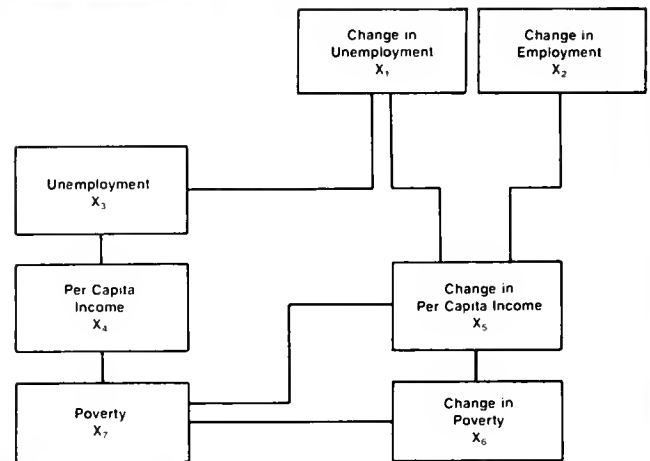
Table 1. Top and Bottom 25 Municipalities in the Chicago SMSA by Level and Trend Scores

	Level	*Score*		*Trend*	*Score*
1	Glencoe	1.68	1	Lincolnshire	2.09
2	Lake Forest	1.46	2	Schaumberg	1.72
3	Winnetka	1.44	3	Thornton	1.51
4	Barrington Hills	1.24	4	Orland Park	1.42
5	Kenilworth	1.22	5	Hazel Crest	1.37
6	Northfield	1.17	6	Warrenville	1.29
7	Wilmette	1.16	7	Woodridge	1.26
8	Olympia Fields	1.15	8	Bartlett	1.17
9	Lindenhurst	1.12	9	Lindenhurst	1.09
10	Highland Park	1.11	10	Palos Hills	1.09
11	Naperville	1.06	11	Algonquin	1.03
12	River Forest	1.05	12	Lake Forest	1.01
13	Deerfield	1.03	13	East Dundee	.95
14	Glenview	.97	14	Winfield	.94
15	Hinsdale	.97	15	Bolingbrook	.91
16	Flossmoor	.94	16	Lisle	.89
17	Northbrook	.89	17	Crestwood	.88
18	Skokie	.89	18	North Aurora	.76
19	Western Springs	.88	19	Northbrook	.71
20	La Grange Park	.87	20	Bloomingdale	.69
21	Lincolnwood	.86	21	Chicago Ridge	.67
22	Elmwood Park	.84	22	Crete	.67
23	Lake Bluff	.84	23	Barrington	.66
24	Lincolnshire	.84	24	Buffalo Grove	.66
25	Berkeley	.83	25	Oak Brook	.65
159	Waukegan	− .83	159	Venetian Village	− .68
160	Blue Island	− .93	160	Stickney	− .69
161	Round Lake Beach	− .97	161	Gages Lake	− .71
162	Calumet Park	− 1.01	162	Willow Springs	− .74
163	Justice	− 1.07	163	Calumet Park	− .77
164	Chicago Heights	− 1.12	164	Carol Stream	− .77
165	Romeoville	− 1.25	165	Aurora	− .79
166	Joliet	− 1.29	166	Posen	− .83
167	New Lenox	− 1.31	167	Cicero	− .84
169	Maywood	− 1.33	168	Summit	− .90
170	Bridgeview	− 1.36	169	Round Beach Park	− .91
171	Hometown	− 1.37	170	Blue Island	− .92
172	Markham	− 1.42	171	Markham	− .95
173	Harvard	− 1.53	172	Steger	− .95
174	Sauk Village	− 1.56	173	Joliet	− 1.15
175	Summit	− 1.56	174	Melrose Park	− 1.16
176	Crest Hill	− 1.57	175	Rosemont	− 1.18
177	Robbins	− 1.57	176	Wilmington	− 1.20
178	Dixmoor	− 1.99	177	Robbins	− 1.25
179	East Chicago Hts.	− 2.31	178	Chicago Heights	− 1.45
180	South Chicago Hts	− 2.78	180	Maywood	− 1.76
181	Wilmington	− 2.81	182	Stone Park	− 1.9
182	Harvey	− 3.20	182	Phoenix	− 2.0
183	Steger	− 3.55	183	Harvey	− 2.76
184	Phoenix	− 4.16	184	East Chicago Hts	− 2.76

Chart 2. Scores for the Trend Model for Municipalities in the Chicago SMSA

score

♦ +1 to +2
• 0 to +1
◊ 0 to −1
★ −1 to −2
☆ −2 to −3

10   20
- - - - - - - - - - -
mile
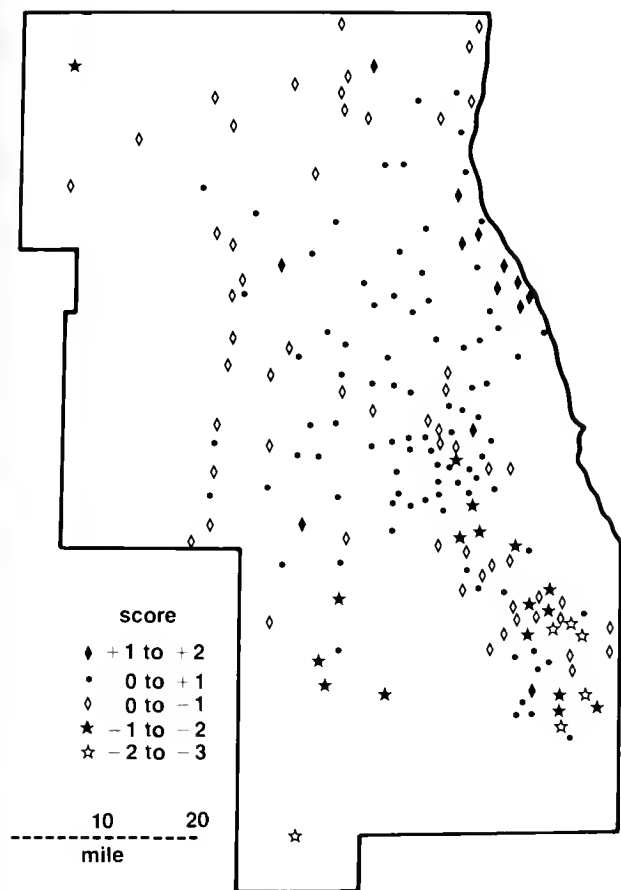
Indices of Economic Health

Using this model and a statistical technique known as the path analysis, it is possible to construct indices (or scores) of the economic health of a community. The exact procedure is described fully in the forthcoming article. Here, attention is focused on the results of the analysis. Table 1 gives the names of the top and bottom 25 municipalities and the scores associated with their economic health by level and trend. The scores are normally distributed with a mean of 0 and a standard deviation of 0.87. Table 2 focuses upon changes from 1970 to 1980. The following are some conclusions based on these scores.

(1) The well-to-do North Shore and northwest suburbs demonstrate high current levels of health, but they are less highly rated on the trend scale. This is a function of the "nowhere to go" syndrome that is not necessarily indicative of favorable economic health.

(2) The old industrial suburbs are at a low level of current health *and* show negative economic trends. In terms of the actual values for each of the variables, the communities near the bottom of the list are no better off than if they were located in Third World countries.

(3) Further study shows that the bottom 25 suburbs in both categories contain most of the black suburban population. Only in such places as Broadview, Evanston, and Bellwood are there substantial numbers of blacks in moderate or well-to-do suburbs. The outward migration from Chicago has been selective: the segregation level in the suburbs is among the highest in the United States.

(4) The top 25 communities on the trend scale contain 8 of the 20 growing suburbs (see Table 2). Population growth from 1970–1980 correlates with the trend ranking at the +.42 level. Clearly, this shows that not only does rapid growth correspond to increases in employment, but it also correlates with increasing per capita income and favorable trends in poverty levels. People who migrate to the suburbs tend to be at a higher income level than are those who already live there.

Table 2. Fastest Growing Municipalities in the Chicago SMSA from 1970 to 1980

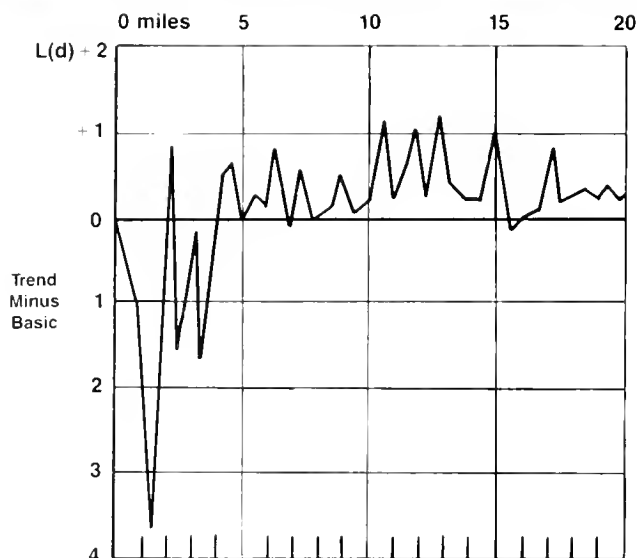|	Absolute Increases			Percentage Increases	
1	Schaumburg*	34,824	1	Bolingbrook*	387.0
2	Bolingbrook*	29,610	2	Bloomingdale*	325.7
3	Naperville	19,807	3	Bartlett*	278.6
4	Mount Prospect	17,639	4	Richton Park	267.6
5	Hanover Park	16,984	5	Orland Park*	260.6
6	Orland Park*	16,654	6	Carol Stream	248.9
7	Hoffman Estates	16,020	7	Schaumberg*	187.7
8	Tinley Park	13,606	8	Roselle	173.0
9	Wheaton	11,905	9	Gurnee	162.7
10	Glendale Heights	11,757	10	Lisle*	155.7
11	Carol Stream	11,038	11	Palos Hills*	151.2
12	Roselle	10,827	12	Hanover Park	145.8
13	Woodridge*	10,735	13	Warrenville*	129.2
14	Downers Grove	10,147	14	Countryside	128.3
15	Palos Hills*	10,025	15	Round Lake	126.0
16	Wheeling	10,023	16	Matteson	115.6
17	Buffalo Grove*	9,897	17	Country Club Hills	112.1
18	Bartlett*	9,753	18	Tinley Park	108.2
19	Bloomingdale*	9,685	19	Glendale Heights	103.1
20	Elk Grove Village	8,333	20	New Lenox	102.9

*In top 25 of trend rankings

Spatial Pattern of Economic Health

The regional map shows the spatial distribution of the trend scores. An analysis was carried out that attempts to identify spatial autocorrelations among the trend scores. High spatial autocorrelation implies that there is an association among nearby municipalities because they display similar scores. Our measure of spatial autocorrelation took into account (controlled for) the spatial clustering of suburban municipalities. From the regional map it is clear that there are pronounced pockets of decline. This shows up in Chart 2 as a consistent, statistically significant, pattern of negatively associated municipalities.[1] Unlike municipalities with positive trends, those with

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Chart 3.   Differences in Indicator Values [L(d)] between the Trend Model Results and the Basic Spatial Pattern of Municipalities by 0.5 Mile Increments

negative trends are decidedly spatially grouped. An inference from this is that municipalities with negative scores, more than those with positive scores, tend to display epidemiological characteristics.

Conclusion

The city of Chicago has been the great generator of economic change in its metropolitan area. Although some communities in the outer suburbs may appear to be independent of trends in Chicago, many are the beneficiaries of the city's recent economic decline. The fastest growing suburbs are now as far as 30 miles from the Loop. As the number of Chicagoans of middle and upper income declines, however, the ability of Chicago to fuel economic advances in the suburbs will inevitably diminish. It follows that what now are the outer suburbs will begin to experience the decline now evident in the inner suburbs. Currently, for middle income people there is a perceived need to escape declining communities; this results in further

deterioration. Favorable economic health will come to the city of Chicago and its declining suburbs only when residents see economic advantages in nonmigratory behavior. Officials of declining municipalities would do well to rethink their policies toward those real estate and business interests that are willing to consider developing attractive housing and employment centers closer in.

Our study has highlighted the extreme differences in trends in the suburbs of a single large metropolis. Even with many healthy communities, one cannot consider the Chicago SMSA to be economically sound until the disparities between communities are brought within bearable limits. Since the economic well-being of the municipalities is dependent on their neighbors and on Chicago, it would be in their best interests to develop region-wide plans for growth, preservation, and development.

[1] The diagram shows values of $L(d)$, a measure of association among communities at different distances from one another. Positive values imply that municipalities with similar high positive scores are spatially related while negative values mean that municipalities with negative values are spatially related. Chart 2 shows that the negative values dominate over short distances (up to 3.5 miles). This means that neighboring communities with strong negative values are spatially related.

Arthur Getis is a professor of geography at the University of Illinois at Urbana-Champaign. This research was sponsored in part by the Office of Real Estate Research at the University of Illinois at Urbana-Champaign.

JAMES R. FOLLAIN

Should Real Estate Brokers Support Tax Reform?

The tax reform movement that began in earnest nearly two and one-half years ago has gained substantial momentum in the past month because of the tax reform plan passed by the Senate Finance Committee (SFC). The SFC plan represents substantial tax reform and many groups around the country have joined the tax reform bandwagon. Senator Packwood, the Chairman of the Senate Finance Committee, was recently quoted as saying that he has never seen such a broad spectrum of support for a piece of tax legislation.

It has been claimed by some that the real estate industry should be less than enthusiastic about the kind of tax reform represented by the SFC plan. The fear is that this reform will cause serious damage to the real estate industry, in general, and the housing market, in particular. As a result, some organizations that represent the real estate industry have lobbied against the SFC plan and urged their members to do so as well.

For the past year I have studied the various proposals put forth by the Treasury Department, the President, the House of Representatives, and, now, the Senate Finance Committee. I have just edited a book that contains my analysis and that of many others entitled *Tax Reform and Real Estate.* An addendum to that book entitled "The Impact of the Senate Finance Committee's Plan for Tax Reform on Real Estate" by Patric Hendershott and me is also available. Based upon this body of work, I feel much of the concern expressed by the real estate lobbying organizations is overstated. Indeed, I would like to argue that tax reform à la the SFC plan is a good idea for the long-run interests of both the real estate industry and the real estate brokerage profession.

There are four reasons why the real estate brokerage industry should support tax reform. The first and foremost is that tax reform will result in a more efficient allocation of our existing capital stock. Currently, the decision to invest is too heavily influenced by noneconomic considerations. That is, the tax consequences of an investment rather than its economic return often dictate whether an investment should be undertaken. In the real estate industry, this has resulted in a huge shift in resources into "tax driven" real estate deals. Furthermore, these deals too often are conducted by people expert in the tax consequences of the investment but unfamiliar with the economic consequences. Tax reform will force future investors in real estate to give more weight to the economics of the investment. In the long run, this must be good for the real estate industry and the professional real estate people who serve it.

Second, tax reform means lower interest rates. Each of the major reform proposals under consideration calls for substantially lower marginal tax rates. A move to lower tax rates will almost certainly result in lower interest rates because the government will no longer pick up 50 percent of the cost of debt. Exactly how low interest rates will go depends upon a host of factors, but a decline of 100 basis points is reasonable. As everyone in the real estate industry knows, lower interest rates are good for real estate, especially housing.

Third, tax reform means a higher homeownership rate. The SFC plan hits rental housing harder than it does the cost of homeownership for most households. In fact, if interest rates decline by 100 basis points, the cost of homeownership may actually decline for many middle-income households. Thus, it seems quite reasonable to predict that tax reform as the SFC plan describes will result in a higher aggregate homeownership rate in this country. Given that the overwhelming majority of real estate brokers serve the single-family homeowner market, such an outcome should be considered highly desirable by the majority of the real estate brokerage industry. Fourth, tax reform might mean greater rates of economic growth. The scientific basis for this statement is less certain than the first three, and so I could be accused of speaking more from my heart than my mind. Evidence is available, however, that suggests that the work effort forthcoming from many high-income professionals has increased as a direct consequence of the 1981 cut in the maximum individual tax rate from 70 to 50 percent. If tax reform can have this effect on the work effort of professionals— for example, people in the real estate brokerage industry—then tax reform could have a substantial and positive effect on long-run economic growth in this country. And, as anyone in the real estate industry will tell you, economic growth is the single most important determinant of a strong housing market.

Tax reform is a complex subject. No one who has studied it can say with certainty its final effects. Also, there will undoubtedly be some real estate losses in the short run and a rise in the long-run level of rents on residential real estate. This is inevitable given the enormous tax preferences granted to certain types of real estate earlier in this decade. However, I can say with confidence that the long-run health of our economy requires that investment decisions be based upon sound economic considerations. Given that tax reform as described in the SFC plan moves strongly in that direction, I ask that you give it serious consideration.

Illinois Business Indexes

This issue of the *Illinois Business Review* highlights Illinois' building permit series. On the facing page, graphs are presented for residential housing units and the value of residential housing; industrial buildings; offices, banks, and professional buildings; stores and other mercantile buildings; and other buildings. None of the six series has been adjusted for any seasonal variation. As one would expect, therefore, there are obvious seasonal trends for all of the series.

Low values for the winter months reflect decreased construction, while summer months have typically shown increased activity. The seasonal pattern is generally true for the residential housing and industrial buildings series. The other three series exhibit different behavior. The offices, banks, and professional buildings series has peaks in December and January along with troughs in April, May, and June. The stores and other mercantile buildings series shows an upturn in December and larger peaks in March, April, and May much higher than for those of June and July. The other buildings series rose in December but fell again for January, February, and March.

Illinois Business Indexes

	Percent Change May 1985-May 1986	May 1986	April 1986	March 1986	Feb 1986	May 1985	April 1985
Coincident Indicator (1969 = 100)	1.87%	126.28	124.70	119.04	119.80	123.96	122.29
Employment-manufacturing (in thousands)[e]	0.84%	959.8	964.4	966.0	964.9	951.8	953.3
Average weekly hours-manufacturing[f]	1.49%	40.8	40.7	40.9	40.1	40.2	40.3
Weekly earnings-manufacturing[e]	4.04%	$432.89	$431.01	$433.13	$422.65	$416.07	$416.30
Help wanted advertising-Chicago (1969 = 100)[a]	-7.29%	89	94	94	93	96	94
Help wanted advertising-St. Louis (1969 = 100)[a]	1.56%	65	65	70	70	64	64
Retail Sales (in millions)[b]	-2.35%	$5,491	$5,265	$5,132	$4,355	$5,623	$5,283
Coal production (in thousands of tons)	-11.22%	5,457	5,866	5,485	5,309	6,147	5,196
Petroleum products (in thousands of barrels)[e]	0.82%	2,450	2,510	2,502	2,650	2,430	2,593
Vendor performance[g]	25.00%	55.0%	50.0%	50.0%	48.0%	44.0%	44.0%
Building permits (in thousands)							
Residential housing units	29.20%	6.093	6.362	2.247	1.009	4.716	3.723
Value of residential housing	47.41%	$374,180	$374,451	$204,774	$111,698	$253,833	$212,888
Value of nonresidential construction							
Industrial buildings	45.13%	$49,990	$21,912	$21,632	$20,295	$34,445	$20,462
Office, banks, and professional buildings	-7.92%	$29,418	$32,654	$8,196	$38,003	$31,949	$63,386
Stores and other mercantile buildings	39.18%	$44,558	$36,378	$38,386	$17,452	$32,014	$29,503
Other	555.59%	$2,782	$3,903	$1,282	$1,693	$6,264	$2,427
Consumer price index (December 1977 = 100)							
North Central US[c]	0.64%	—	173.9	—	175.4	—	172.8
North Central-population more than 1,250,000[c]	1.08%	—	177.8	—	179.2	—	175.9
North Central-population 385,000 to 1,250,000[c]	0.23%	—	172.1	—	173.7	—	171.7
North Central-population 75,000 to 385,000[c]	-0.06%	—	168.5	—	170.4	—	168.6
North Central-population less than 75,000[c]	0.53%	—	170.0	—	170.7	—	169.1
Chicago (1967 = 100)	1.38%	324.2	323.7	323.9	326.4	319.8	319.1
St. Louis (1967 = 100)	0.85%	318.6	—	319.2	—	315.9	—
		1985 IV	1985 III	1985 II	1985 I	1984 IV	1984 III
Personal income (in millions)[d][e]	4.36%	$169,265	$165,131	$166,908	$164,894	$162,200	$160,180
Per capita personal income[d][e]	3.34%	$14,492	$14,148	$14,311	$14,148	$14,024	$13,871

[a] The Conference Board, *Help Wanted Advertising* May 1986. [b] Latest month projected by BEBR. [c] Percent change between April 1985 and April 1986. [d] Percent change between 1984 IV and 1985 IV. [e] Recent month is preliminary figure. [f] Seasonally adjusted at annual rates. [g] Percentage of companies receiving slower deliveries

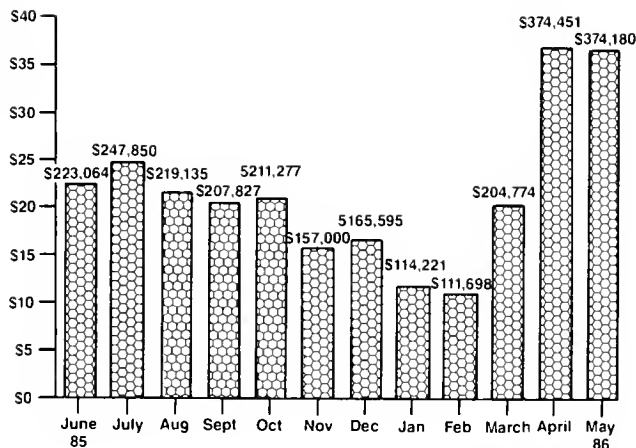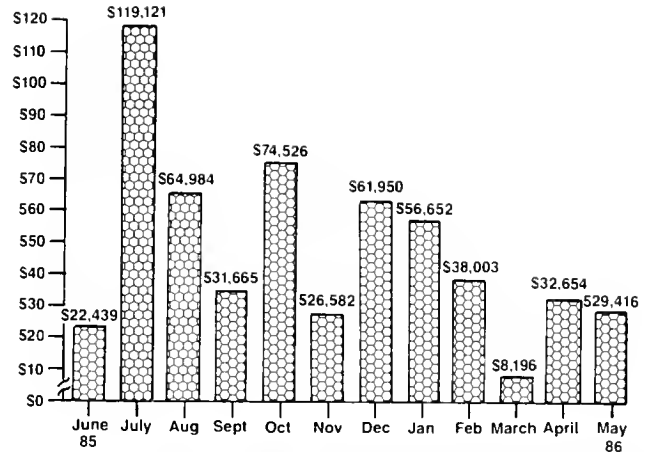## Residential Housing Units
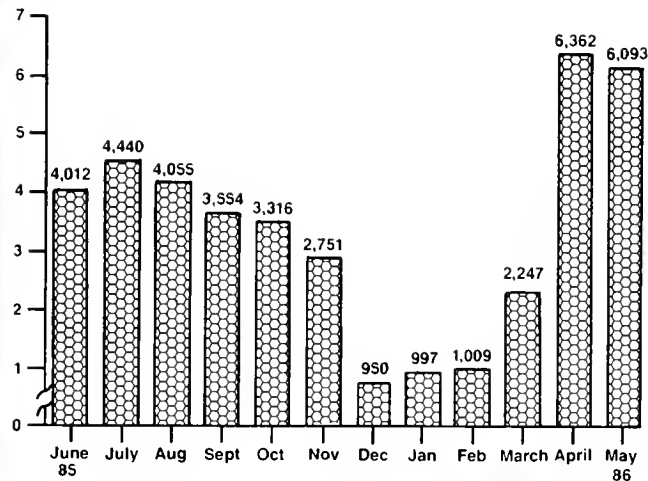
June 85	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May 86
4,012	4,440	4,0SS	3,SS4	3,316	2,751	9S0	997	1,009	2,247	6,362	6,093

Value of Industrial Buildings (thousands of dollars)

June 85	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May 86
$28,321	$34,493	$30,617	$26,517	$34,849	$30,241	$13,340	$18.901	$20,295	$21,632	$21,912	$549,990

Value of Residential Housing (thousands of dollars)

June 85	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May 86
$223,064	$247,850	$219,135	$207,827	$211,277	$157,000	$165,595	$114,221	$111,698	$204,774	$374,451	$374,180
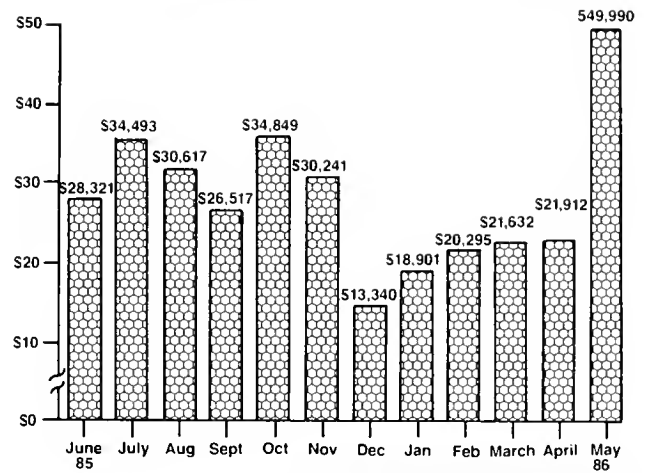
Value of Offices, Banks, and Professional Buildings (thousands of dollars)

June 85	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May 86
$22,439	$119,121	$64,984	$31,665	$74,526	$26,582	$61,950	$56,652	$38,003	$8,196	$32,654	$29,416

Value of Stores and Other Mercantile Buildings (thousands of dollars)

June 85	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May 86
$17,680	$31,400	$2S,516	$34,035	$35,041	$15,694	$21,667	$10,822	$17,452	$38,388	$36,378	$44,558
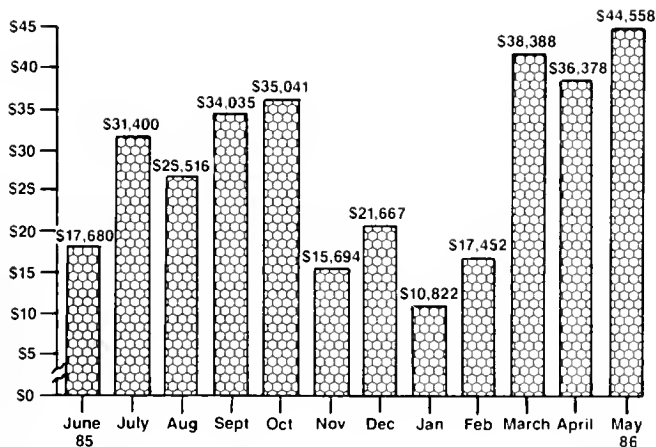
Value of Other Buildings (thousands of dollars)

June 85	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May 86
$6,274	$5,07S	$S,540	$3,507	$4,502	$3,534	$4,534	$1,718	$1,693	$1,282	$3,903	$2,782

CARLA TIGHE

National Banking Now

On 1 July 1986 Illinois instituted regional interstate banking. Illinois banks may now be purchased by out-of-state banks if the home states of the purchasers have reciprocal laws. The Illinois law permits interstate banking only within the six-state region surrounding Illinois.

Of the six contiguous states identified by Illinois law, Indiana, Michigan and Kentucky have passed comparable legislation. Similar bills are expected to be passed in Wisconsin and Missouri. Iowa is not expected to act on the issue in the near future.

Regional interstate banking will strengthen midwestern banking. Large banks can take advantage of economies of scale, making them more efficient and less likely to fail. However, the reasons justifying regional interstate banking also hold for national interstate banking. The Illinois law needs to be expanded to allow for banks outside the area (in states having reciprocal laws) to buy Illinois banks. Furthermore, in order for Illinois to remain competitive, we need to be among the first to pass legislation that allows national branch banking.

This brings us to the primary reason for widening the Illinois law at this time: other states have already done so. Since the Supreme Court overruled federal laws prohibiting interstate banking in 1985, many states have provided for interstate banking on a regional level. Several have also included a timetable to open the states to nationwide branch banking.

The Illinois law, on the other hand, contains specific provisions to keep nonadjacent states' banks out of Illinois. Provisions to constrain branching to the region may limit the effectiveness of our law, although regional interstate banking is expected to make Chicago into an even greater financial center. The many corporate headquarters and rapidly growing suburbs make Chicago an attractive location for out-of-state banks. However, if surrounding states allow for nationwide banking before Illinois does, Chicago's financial growth could be curbed. It is plausible to imagine that New York banks would merge with banks in Milwaukee or Indianapolis. After all, these cities also have important advantages. Illinois banks outside Chicago should be concerned for two reasons. First, Illinois banks may find the best merger opportunities

have been lost to banks in states that allowed national banking earlier. Secondly, the initial merger activity will have strengthened competitor banks in surrounding states. In this sense, Illinois banks may find themselves left behind. Illinois needs to be among the first who promote growth by opening its doors to nationwide banking.

Increased Efficiency

There are a number of reasons why growth is important to the Illinois banking system. First, strong midwestern banks with interregional branches can better compete with the giant banks in New York and on the West Coast. Larger banks can also take advantage of economies of scale and compete more efficiently. Merged banks can eliminate duplicative departments. Combining capital-intensive operations such as data processing will also help banks to operate more efficiently. Larger banks are able to raise funds at lower interest rates.

Considerations such as those outlined above serve to lower the cost of banking for consumers and to increase the range of available services. Therefore we would expect to experience lower service fees, increased loan availability, and increased convenience. Also, large national banks can better serve corporate customers whose executives travel frequently or who have many nationally dispersed offices or plants. In short, a national banking system can better serve the consumers.

Decreased Failures

Promoting growth at the national level is also justified for the simple reason that stronger banks are usually less likely to fail. Regional banks in the Midwest will continue to hold loan and deposit portfolios that are heavily balanced towards agriculture and heavy manufacturing. These industries are experiencing serious problems of their own that feed back into the local banking system. An Illinois bank that could also do business in, for example, the "high-tech" corridors of Boston is more likely to weather a regional recession. Also, smaller individual banks may find it more profitable to sell to a national holding company rather than to face increased competition, leading banks that might fail on their own to merge while they are still financially healthy. Thus national branch banking can increase confidence in Illinois banks by making them stronger.

Because the argument in favor of national branch banking is so strong, many analysts view this as the

next step after regional banking becomes common. However, it is unlikely that the legislation providing for branch banking will be passed by Congress. Instead, national banking will spread as individual states pass reciprocal laws allowing it (as some have already done). Illinois needs to be among the first to take that next step by allowing banks outside the Midwest to acquire Illinois banks if their states have reciprocal laws.

National banking provides increased services more efficiently and strengthens the banking system. With the number of bank failures rivaling the number that occurred during the Great Depression, the benefits of national banking cannot be taken too lightly. For all these reasons, Illinois should have national banking now.

DAVID LEE

Illinois Leading Indicators

T he outlook for the Illinois economy is for slow and steady growth over the next two quarters. This is the conclusion drawn by the index of leading indicators recently developed by the Bureau of Economic and Business Research at the University of Illinois at Urbana-Champaign. Of course, no leading indicator series, including the series constructed for the US economy, can always make an accurate forecast of swings in economic activity. However, careful development of a leading indicator series at the state level can lead to recognizable patterns in the series behavior that are able to indicate when the Illinois economy is about to change direction.

This article begins with a description of the methodology used to construct a leading economic indicator for Illinois. Next, adjustments made to the series based on the concept of a moving average are described, followed by the development of an algorithm to determine if the leading indicator series is correctly predicting turns in state economic activity. Finally, the performance of the series is reviewed over a recent 24-month period.

Construction of the Leading Indicator Series

The leading economic indicator is constructed in a manner similar to that employed by the US Commerce Department in compiling the national leading indicator index as described in the *Handbook of Cyclical Indicators*. However, state economies are subject to a number of influences that are not found at the national level. For example, the Illinois economy has agricultural activity as a higher percentage of its economy than does the nation as a whole. For this reason, the components of a leading economic index constructed on a statewide basis are necessarily

different from those used in the national tabulation.

Each component of the Illinois leading economic indicator series was chosen on the basis of two important factors. The first relates to the speed with which data pertaining to the series are available; thus, even if an economic series were to lead economic activity perfectly, that series would be of little value if it were available only after a substantial time lag. Second, each series must lead economic activity both in theory and by inspection to avoid problems of spurious correlation. For example, if tuna sales led Illinois economic activity with a perfect three-period span, that series would be rejected as a component of the overall index because there would be no theoretical justification for its inclusion.

With these considerations in mind, the following monthly series were selected as the components used to calculate the leading indicator index for Illinois: average hours of durable manufacturing employment, building permits, initial claims for unemployment, income tax receipts (a proxy for personal income), sales tax receipts (a proxy for retail sales), Chicago vendor performance (percent of vendors reporting slower deliveries), and the help wanted indexes for Chicago and St. Louis. The data were seasonally adjusted using the X-11 Arima seasonal adjustment routine and transformed into an index (1972:1 = 100). After percentage changes in these indexes were calculated, a final series of components was generated by dividing the percent change by the average percentage change for each series. This was done to avoid series with high degrees of fluctuation from dominating the overall index. Finally, a composite index was constructed from an unweighted average of the eight individual components. This index and its components are illustrated in Charts 1–3 for January 1980 through June 1986.

Chart 1.

Chart 2.

Avg. Hours of Durable ---- Income Tax Receipts ==== Sales Tax Receipts
Goods Employment

Chart 3.

—— Building Permits ---- Unemployment Claims ==== Composite Index

Chart 4.

—— Non-agricultural   ==== Composite Index
Employment Index

Adjustments to the Series

By comparing the composite index to an index of total Illinois nonagricultural employment, two observations can be made (Chart 4). First, as calculated above the composite index is extremely volatile. Second, this index does in fact lead the four major turns in the Illinois economy during the sample period (1972:1–1986:6). The economy experienced two peaks (1974:10 and 1979:8), and two troughs (1975:10 and 1983:8) over the time frame under study. However, the high degree of series volatility makes changes in overall trends difficult to assess. Therefore, the series is adjusted by performing a three-period moving average in the overall index. This series represents the final leading economic indicator series for the Illinois economy (Chart 5).

Identifying Peaks and Troughs

The next step is to specify a rule that allows the researcher to distinguish between changes in series trends that are short-lived as opposed to those that represent a turning point in the overall trend. An example of rules similar to this but somewhat different in application are the rules used by analysts who chart stock market activity. These people recognize that various patterns in the historical price of a stock can indicate a major change in the movement in the stock's price. For instance, the third dip in a stock's price may signal a prolonged fall in the price while a break through the 26-week high could signal of a rising price. Application of these principles to the leading indicator series represents a method for determining changes in the series overall trend, which in turn will signal major changes in future economic activity.
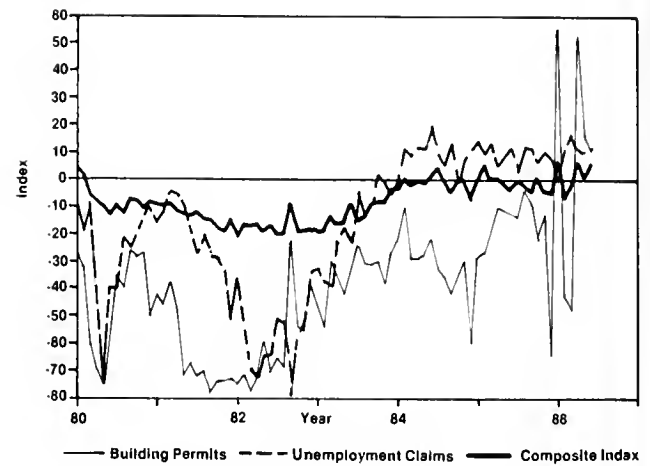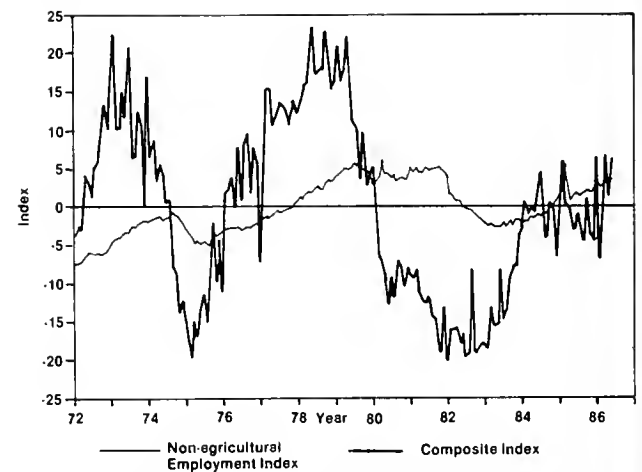
The methodology for selecting a rule that will indicate changes in economic activity is based on a simple statistical property of a moving average. Specifically, it is a fact that as the number of periods included in a moving average of an increasing series is increased, the value of the averaged series relative to the value of a moving average series with fewer periods will decrease. Hence, a four-period moving average will always lie below a two-period moving average for an increasing series. Similarly, the value of a moving average series will increase as the number of periods included in the average increases when the series is decreasing. Thus, a four-period moving average will lie

above a two-period moving average if the series is in decline. Finally, when the series changes direction, it must be the case that moving averages of different lengths must cross, and it is the identification of these crossing points that will constitute the rule for change in the trend of the series.

Unfortunately, the procedure outlined above is not so simple if applied to the leading indicator series because of the fluctuations that remain in the series even after smoothing with a three-period moving average. Such variation results in brief periods of time in which the series is in decline even though the overall trend of the series is increasing. Furthermore, the series may increase for a few periods while the general trend of the series is waning. The problem is that such periods cause moving averaged series of different duration to cross even if the overall trend of the series has not changed. Thus, the task is to determine the number of periods to include in the moving average so as to eliminate or minimize the number of false signals emitted concerning turns in the general trend of the series.

Chart 6.

Non-agricultural Employment Index — Composite Index(MA3) — Composite Index (MA8)

Source: Nonagricultural Employment Index—US Department of Labor, Bureau of Labor Statistics, and Bureau of Economic and Business Research, University of Illinois at Urbana-Champaign.

Chart 5.

Non-agricultural Employment Index — Composite Index (MA3)

Source: Nonagricultural Employment Index—US Department of Labor, Bureau of Labor Statistics, and Bureau of Economic and Business Research, University of Illinois at Urbana-Champaign

Chart 7.

Non-agricultural Employment Index — Composite Index(MA3)

Source: Nonagricultural Employment Index—US Department of Labor, Bureau of Labor Statistics, and Bureau of Economic and Business Research, University of Illinois at Urbana-Champaign

After examining numerous combinations of moving averages, the rule selected for the Illinois leading economic indicator series is as follows: If the three-month moving average series rises above or falls below the six-month moving average series for four consecutive months, then the leading indicator series is communicating a major change in economic activity (Chart 6). This particular rule for determining changes in economic performance was chosen because it represents a simple algorithm for determining such changes, and because it did not send incorrect signals about up-turns or down-turns in the state economy over the sample period. However, the accuracy of such a rule
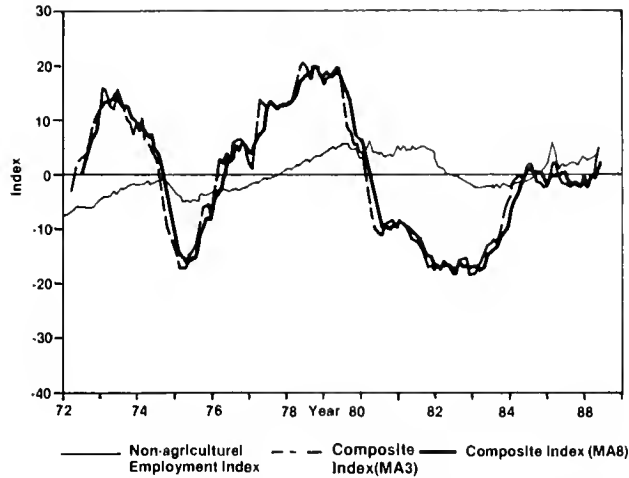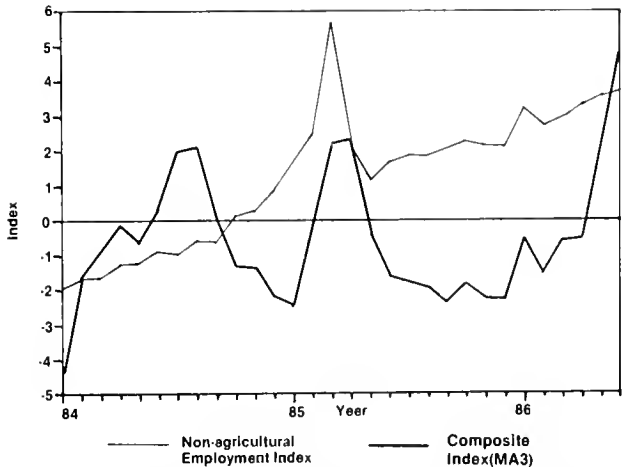
is hindered by the fact that only four turns occurred during the sample period. With such a low number of observations, any rule must be suspect.

Behavior of Index: January 1984 to June 1986

The 30-month span from January 1984 to June 1986 yields a particularly interesting illustration of the behavior of the leading economic indicator series (Chart 7). For the first eight months of 1984, the series continued to increase, corresponding to a simultaneous increase in the index of nonagricultural employment. However, the series took a dramatic five-month plunge beginning in September 1984, indicating that

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recessionary pressures were on the horizon for the Illinois economy. In April of 1985, this prediction turned out to be correct as the employment index began to decline over the next two months. Therefore, the leading indicator index had correctly anticipated the economic downturn with a lag of seven months.

The more recent history of the leading economic indicator series is less certain than that of previous months. The series increased for the first four months of 1985, while staying above the six-month moving average for only three periods, signaling the potential for an economic upswing. As implied, the economy did in fact offer a slight rebound beginning in June of 1985. Unfortunately, the leading economic indicator series again began to dip in May 1985 and remained below the six-month moving average for seven months. This development signals a minor decline in Illinois economic activity beginning somewhere in the last half of 1986. This corresponds to many predictions made by economists before the drop in oil prices in the first part of 1986. However, December of 1985 showed a marked improvement in the index, and a continued increase in the index for the first six months of 1986 suggests that the predicted downturn may never materialize. Instead, the index seems to indicate slow steady growth in economic activity over the next two quarters.

Conclusion

There are a number of problems with this formulation of the leading indicator series. First, the series is constructed on the basis of a simple average compared to the weighted-average method employed by the Commerce Department. However, such a weighting scheme, based on a somewhat arbitrary method of "scoring" component performance, is not a major improvement over a method using only a simple average. A second problem with the leading indicator series is that the lead times are not very consistent over the study period. For example, the series leads the downturn in the economy beginning in 1974:5 by 14 months, yet it leads the recovery which began in 1975:10 by only 6 months. This is a serious problem that does not have an easy solution. In fact, the Commerce Department does not indicate the period by which the US series leads the national economy. However, the series described here does present a method of quantifying predicted changes in the state economy based on the performance of several key components of the Illinois economy.

JAMES R. FREW and G. DONALD JUD

Real Estate Brokerage Franchises: What Are Their Value?

In recent years, many real estate brokerage firms have chosen to affiliate with national or regional franchise organizations. The Department of Commerce estimates that there were some 15,413 franchisee-owned real estate brokerage firms in the United States in 1981. Franchise affiliates made up about 30 percent of all real estate brokerage establishments, and they had gross commissions totaling more than $3.2 billion in 1981. Commission income received by franchise firms grew 15.3 percent during 1981–83, while the number of franchise brokerage establishments increased 13.2 percent.

In the brokerage industry as elsewhere, franchising involves the sharing of intangible capital such as trademarks and goodwill between the franchisor and his franchisee. This kind of sharing often evolves because of a divergence between the scale of operation most efficient for promoting and advertising a brand or trademark and the scale of operation most efficient in the actual production of the product or service.

In the real estate industry, national trademarks or brand names are useful to consumers because it is difficult for buyers and sellers who are unfamiliar with a local housing market to obtain information on the quality of services available from local brokers. Instead of trying to gather information on their own, many buyers and sellers rely on a national trademark as a guarantee of minimum quality of service.

A survey conducted by the National Association of Realtors in 1980 revealed that 78 percent of respondents felt that "reputation of agent or firm" was very important in selecting a real estate agent. In contrast, only 28 percent listed the "commission or fee" charged by the broker as being very important.

Recognition of the importance of "reputation" to consumer choice in the brokerage industry suggests why brokerage trademarks manufactured through national advertising may yield significant economic

benefits. The National Association of Realtors has for many years sought to establish "Realtor" as a brokerage trademark. More recently, as federal antitrust decisions have curtailed the ability of realtors to continue their traditionally exclusionary practices, some individual brokers have formed associations to jointly promote themselves on a metropolitan or regional basis.

The value of a franchise affiliation or trademark to an individual real estate broker depends on the quality it "guarantees" to buyers and sellers. The promise of quality service to consumers is promoted by the franchisor through advertising and must be maintained through proper monitoring of the operations of franchise affiliates. For a franchise affiliation to have value over time, the franchisor must continue to advertise and to police the operations of the franchisees.

When a real estate broker buys into a franchise, he purchases the promise of the franchisor of the future value of franchise affiliation. Because future value to the broker depends on future actions by the franchisor, the broker (or any franchisee) usually will have a healthy skepticism about the worth of affiliation. The franchisor normally will not be able to get the broker to agree to pay a single, lump sum up front. Instead, payment for affiliation usually consists of some up-front charge plus a royalty fee collected as a percentage of sales. In this way, payments to the franchisor are linked to the future success of the franchisee, which in turn depends in part on the actions of the franchisor. In essence, the broker and the franchisor become partners in a joint enterprise, and each shares in the future profits of that enterprise. The franchisor usually will insist that the royalty fee be calculated on the basis of sales (or total revenue) rather than profits. This arrangement gives the broker (franchisee) the correct incentive to be efficient in the operation of those aspects of the enterprise that are under the broker's direct control.

We examined the impact of franchise affiliation on the operations of real estate brokerage firms in a recent article in the *AREUEA Journal*. ("The Value of a Real Estate Franchise," Vol. 14 (Summer 1986), pp. 374–83.) The following sections provide a summary of that article.

Franchise Affiliation is More Prevalent in Areas of Rapid Growth

A real estate franchise provides assurance of minimum quality to persons who must operate in a unfamiliar market setting. The greater the number of such persons in a local market, the more firms in that market are likely to choose to be franchise affiliated. An analogous situation is eating establishments along an interstate highway. Because most travelers on the highway are unfamiliar with local restaurants, it is usually advantageous for a restaurateur to affiliate with a franchise.

A similar situation exists in the real estate brokerage industry. In rapidly growing areas of the country, a large number of home buyers are recent inmigrants from outside the local area who are generally unfamiliar with

the local housing market and have limited time to devote to searching because of the pressures of employment transfer. It is natural for such buyers to be drawn to a national franchise or trademark, and thus we can expect franchise affiliation among brokers in these areas to be more prevalent.

We found this to be the case when we looked at the fraction of real estate brokerage firms that were franchise affiliated in each of the 50 states. We found a significant positive correlation between the fraction of firms franchise affiliated and the rate of state population growth. This correlation suggests to us that franchise affiliation is more profitable for brokerage firms located in areas of rapid growth, where there is a substantial influx of buyers from outside the area.

Franchise Members Sell Higher-Priced Listings

If franchise affiliation provides prospective buyers with quality assurance, member brokers may attract those who wish to buy higher-priced listings. Of course, all agencies compete to assist these buyers, and since brokerage fees are typically a "percentage" of the sales price, selling more valuable property yields larger sales commissions. But such sales are particularly desirable to franchised agencies because association with them gives tangible support to the "quality image" that franchise membership is designed to enhance. Thus, affiliates should be eager to capitalize on any advantage expensive homebuyers perceive exists in enlisting their assistance, and greater quality assurance may give them the competitive edge they need over independent agencies.

To test this hypothesis, the average asking price of homes sold by franchise affiliates in Greensboro, North Carolina in 1979 was compared to that of independents. The average of 487 franchise sales was $44,152, while that of 446 independent sales was $41,727. A t-test revealed that the franchise group's average was significantly higher at the 95 percent (one-tailed test) confidence level. To be sure that this indicated a higher true market value rather than simply higher asking prices, actual sales prices of the properties sold by the two groups were also compared. Again, the franchise average ($43,142) was significantly higher than the independent's ($40,906) at the 95 percent confidence level.

These differences indicate to us that franchised firms attract a somewhat different mix of customers than nonaffiliated firms. Part of this difference stems from the fact that franchised firms attract more buyers who are moving in from out of town. In Greensboro, out of town homebuyers moving in from the North and East tend to have higher incomes and to spend more on housing than do resident buyers.

Franchise Affiliation Increases Brokerage Sales

To quantify the value of franchise membership, we conducted a survey of brokerage firms in three North Carolina cities (Charlotte, Greensboro, and Raleigh) during 1982. Brokers were questioned about the structure and operation of their businesses and their attitudes toward real estate franchising.

All agencies in the three cities (that were listed in the yellow pages) were surveyed, and responses were obtained from over 50 percent of them, a very high percentage for a survey requesting information of such strategic importance to competitors. This high a response rate minimized one important source of estimation error: sample bias. To further reduce such bias, firms who indicated that they did not consider residential real estate sales their main specialty were removed from the sample. Eighty-four responses remained; 21 percent of these (18) reported that they were affiliated with a franchise.

Comparison of the experience levels between the two groups revealed little difference, but franchised firms did have somewhat larger staffs who possessed different amounts of experience. Large differences were reported in sales. Franchise affiliates reported an average of $4.5 million in sales.

To determine what portion of the difference in average sales to attribute to the franchise membership, rather than differences in other characteristics, a regression equation was estimated. The regression equation statistically held constant other factors that also affect sales, such as, size of the firm's sales force, broker and staff experience, and so on. The analysis revealed that brokerage firms affiliated with national franchises had substantially higher sales than nonaffiliated firms. For the average firm in the sample, franchise affiliation appeared to add about $930,000 to firm sales.

Affiliated Firms Share Gains with National Franchisers

In the brokerage firm survey, franchise firms were questioned regarding the cost of franchise affiliation. The 15 firms affiliated with national franchises reported the following average costs associated with their franchises:

1. Initial Fee $4,000
2. Royalty on Gross Commissions Earned   3%
3. Advertising Fee, Collected on Gross
   Commission   2%

To calculate an average benefit-cost ratio for franchise membership, information on the average commission rate charged on home sales and the normal commission split was required. Talks with local realtors indicated that the average rate charged on residential sales was about 6 percent. Of this, there was usually a 50–50 split between the listing and selling agents. If the salesperson who sold the property was employed by the listing agency, he (she) usually received 25 percent of the total commission, or about 1.5 percent of the sales price.

If the franchise firm is not the listing agency, the firm would normally receive half of the 6 percent commission, or 3 percent of the sales price. Of this, the franchise broker would pay his salesman one-half of what the firm received, or 1.5 percent of the sales price as a sales commission.

Our previous analysis indicated that the average broker received an additional $930,000 in sales because of franchise affiliation. Assuming that he is not (also) the listing agent for these sales, he would retain 1.5 percent of the additional sales, or about $13,950 after he paid his salesman.

The average firm affiliated with a national franchise had $5.3 million in sales. The 3 percent royalty fee plus the 2 percent advertising fee would be collected from this $5.3 million in sales. Assuming that the franchise firm was not the listing agency on any of these sales, the firm would receive gross commissions totaling 3 percent of sales, or some $159,000. Of this the firm would be required to pay $7,950 in royalty and advertising fees to the national franchise organization.

The cost of the franchise also includes the interest on the initial franchise fee. Assuming an interest rate of 10 percent, this would amount to $400. Adding this to the annual fees, the total annual cost of franchise affiliation for the average firm in the sample was estimated to be $8,350, so *the net value of membership was $5,600* (that is, $13,942 − $8,350 = $5,600).

These calculations suggest that the average franchise broker receives a portion of the profits created by the national franchise trademark. Because they receive a net benefit from franchise affiliation, it is to be expected that franchise affiliates would support the franchise arrangement. As expected, the survey also found that opinions of franchising expressed by brokers affiliated with a national franchise were favorable. Of national affiliates, 60 percent agreed with the statement that "franchise affiliation offers greater profit potential." Ninety-three percent agreed that "franchising enhances the competitive ability of the firm." Only 13 percent reported that they planned not to continue their affiliation with their national franchise.

The opinions of affiliates were found to accord with other evidence. *On balance, franchise affiliation in the real estate brokerage industry seems to be beneficial for the average affiliate because the franchisor appears unable to extract the full value of the additional sales that accrue to the affiliated broker because of the franchise trademark.*

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ERRATUM: In the July 1986 *Illinois Business Review* we mistakenly listed Arthur Getis's article, "Economic Well-Being among Chicago's Suburbs," as research funded by the Office of Real Estate Research. This was not the case.

CAROLYN WOJ

Computer Crime:
The Crime of the Future is Here

On 3 June 1986 the House of Representatives passed the Computer Fraud and Abuse Act of 1986. This bill makes the use of computers for certain cases of theft or fraud a federal felony. It is intended to strengthen states' efforts in combating computer crime and is expected to be ratified in the Senate. It should be noted that this bill comes after a computer crime bill passed last year that makes it a felony to use a computer in a way that might harm the national interest. The new bill is more general.

Computer technology affects nearly everyone. There are currently more than 200,000 computer centers in the United States, and we are becoming increasingly dependent on the computer. Total user spending on data processing in the United States is expected to increase from 2.1 percent of GNP in 1970 to 13 percent in 1990.

With the advent of computer technology, there has been an emergence of computer crime. A South African jewelry company reported computer-based thefts worth $3.5 million in August of 1983. A group of youths in Milwaukee penetrated the computerized radiation-therapy records of cancer patients in a Manhattan hospital last summer. When hospital authorities ordered the youths to stop tampering with their computer system, one youth responded that he and his friends "would be stopped in a couple of years by technological improvements in the computer systems." Although computer crime is now common, much remains to be known about the subject. Experts disagree on many aspects of the issue, ranging from how to define computer crime to its prevalence.

Defining Computer Crime

Some experts do not think that computer crime deserves attention as a separate category.

According to this view, computers are merely an up-dated means to commit old crimes. If someone steals a personal computer from a university, this crime can be accurately classified as theft. Misuse of company funds through the use of a computer can be termed embezzlement. Hence, some people feel that the term crime by computer is more appropriate than computer crime.

Others suggest that there are a number characteristics of computer crime that distinguish it from other types of crime. For example, the losses due to a computer crime are generally larger than the losses associated with other crimes. The technology associated with the computer at present also makes it difficult to detect most computer crimes. In fact, most computer crimes are discovered by accident. Even when a computer crime is detected, it often goes unreported. Figures on computer crime are understated due to the problem of detection and a number of other factors. For example, victims of computer crime often fear a loss of public confidence. Also, since proof of the crime is difficult to assemble, there is a heightened risk of false-arrest charges. Some people also feel that the publicity about computer crimes will lead others to try similar things. Another aspect of computer crime that distinguishes it from other types of crime is the difficulty of prosecution. Lawmakers in one-half of the states have only recently enacted laws dealing specifically with computer crime.

Four major categories of computer crime have been identified: introduction of fraudulent records or data into a computer system, unauthorized use of computer-related facilities, alteration or destruction of computerized information or files, and theft by electronic or other means of money, "financial instruments," such as checks and credit cards, and "valuable data" such as computer programs in machine- or human-readable form.

A number of specialists have attempted to examine the extent of computer crime in our society, but since the experts do not agree on exactly what computer crime is, their studies must be interpreted in light of their varying definitions.

A US General Accounting Office (GAO) study defines computer-related crimes as "acts of intentionally caused losses to the Government or personal gains to individuals related to the design, use or operation of the system in which they are committed." The GAO study gathered data from 10 federal investigative agencies. Sixty-nine cases of computer crime were uncovered. The average and median loss caused were found to be $44,110 and $6,749 respectively.

Donn Parker, who conducted a study at Stanford Research Institute (SRI), defines computer abuse as "any incident associated with computer technology in which a victim suffered or could have suffered loss and a perpetrator by intention made or could have made gain." The data for this study were from a variety of sources, and according to John Taber, only 77 of the 375 cases used in the study were verified. In this study the average loss due to computer crime was $450,000, 10 times the GAO estimate. The discrepancy could be a result of the different definitions of computer crime used in each study and the type of cases analyzed. The GAO study focused only on computer crime in the federal government, while the SRI study included the private sector.

A study by Brandt Allen used a more strict definition of computer crime than Donn Parker's. In his study, he divided the SRI data into four groups and estimated the average loss in each category. The resulting average losses per category were as follows:

1. Cases committed in corporations $621,000
2. Cases committed in banks and savings and loans $193,000
3. Cases committed in state and local government $329,000
4. Cases committed in federal government $45,000

When the SRI data were divided, losses as a result of computer crime in the federal government were consistent with the GAO estimates. It is important to realize, however, that the results of these studies are based on data of reported computer crimes. Actual losses may have been quite different from what these figures suggest.

Protection against Computer Crime

Increased computer security is one means of deterring computer crime. In the past, computer systems were designed for easy use by people with limited computer experience. Computer systems that are easily accessible by first-time users are said to be user-friendly. There is a trade-off between increased computer security and the degree to which a computer is user-friendly. In general, if a system is user-friendly it is also vulnerable to unauthorized use. For example, computer networks such as Telenet and Tymshare, rent time on a host computer to numbers of users throughout the nation, and easy access is a key feature of the systems. Floyd Trogdan, head of network services at Telenet states, "We have a public network; it needs to be user-friendly. Would we consider making it harder to penetrate? We might. But you have to recognize that we provide a service and that the general customer wants easy access."

The move to increased computer security has lagged behind the times according to many experts. According to Geoffrey Goodfellow, a computer security researcher at SRI, "I don't think that most people are taking reasonable and prudent measures to protect their computer systems." Martin Hellman, a computer scientist at Stanford University, reinforced this belief: "It's terribly unethical for computer centers and networks to have the low level of security that they do. It's like leaving the keys in the ignition of an unlocked car."

Most cases involving unauthorized access of the University of Illinois computer (that is, theft of computer funds) are due to user carelessness, although the university system has a number of checks and safeguards to protect computer funds. For example, audit trails are built into the system. In addition, whenever anyone uses the computer system a message appears at the beginning of the computer session giving the last time he or she used the computer. If the time given does not seem to be accurate, this could signal unauthorized use of the system. It is ultimately the responsibility of the user to attempt to prevent unauthorized access. The message informing the user

of the last recorded computer session is useless if ignored, or if signon information is left in public. (Signon information consists of an individual's social security number, their password, and billing information. This information must be entered on the computer before using the system.)

Increased computer security is a first step toward deterrence, but it cannot reduce computer crime to zero. As Donn Parker puts it, "With even the most advanced computer systems, there is no known practical way of protecting user organizations if penetrators have sufficient skill, knowledge, access, and resources." Although increased computer security cannot totally eliminate computer crime, experts have agreed on a number of steps that can be taken to reduce the likelihood of its occurrence. Steps identified by the American Society for Industrial Security are as follows:

1. Separation of knowledge through the division of responsibilities, job rotation, physical isolation, controlled access, and logging of stoppages and interruptions.

2. Written programming instructions with threat monitoring and audit trails built in.

3. Careful accounting of all input documents.

4. Periodic changes in access codes and passwords.

5. Scramblers and cryptographic applications in data transmission.

Another means by which computer owners can protect themselves from losses is through the purchase of insurance against computer crime. Insurance provides a very significant risk management option beyond practicing loss prevention procedures. Approximately 20 million electronic-crime policies had been sold as of October 1983. Coverage varies among insurers. With the increase in cases reported in the news recently, demand for computer crime coverage has increased. The dollar amount of policies is expected to reach 100 million in the next three years.

The Need for Computer Crime Legislation

In addition to increased computer security, some experts feel that special computer crime legislation is needed to deter would-be computer criminals. Reasons cited for the need for special computer crime laws include:

1. The current lack of security in computer systems.

2. The difficulty of prosecution under laws that do not deal specifically with computer crime.

3. The need to alert the general public, and computer users in particular, to the risks of computer crime and awaken them from their false sense of security.

One of the difficulties in prosecution under laws not specifically dealing with computers lies in the definition of property. For example, in *Lund* vs. *Commonwealth of Virginia*, the Virginia Supreme Court decided that the taking of computer time and services in the form of printouts did not constitute larceny. The subject matter of larceny must be goods and chattels. The court found that computer time and services were not goods or chattels even though their taking represented a loss to the rightful owners.

Currently, one half of the states have computer crime laws. Florida, in 1978, was the first state to adopt this type of legislation. In 1979, Illinois joined a number of other states in enacting a law against computer crime. According to the Illinois law, a person commits unlawful use of a computer when he or she:

1. Knowingly obtains the use of a computer system, or any part thereof, without the consent of the owner; or

2. Knowingly alters or destroys computer programs or data without the consent of the owner; or

3. Knowingly obtains use of, alters or destroys a computer system, or any part thereof, as part of a deception for the purpose of obtaining money, property, or services from the owner of a computer system or any third party.

The sentences under this law range from a petty offense to a Class 4 felony, depending on the violation and the value of the loss incurred. Penalties range from less than $500 to a maximum of $10,000 and three years in jail. The Illinois law, like many other state laws, does not require that the victim take reasonable care in protecting their system from harm. A contributory negligence standard has not been adopted. In addition, individuals are not required to report a computer crime that they have witnessed. Thus, reliable data on the extent of computer crime will still be lacking. As of the beginning of 1984, no cases were tried under the Illinois computer crime law in an appellate court. This is not surprising, however, given that the law has only been in effect for five years.

State laws do not apply to computer crime offenses involving interstate and foreign commerce. In these cases, prosecution under federal law is necessary. A federal computer crime bill was first introduced in 1977, and since this time it has undergone a number of revisions.

Conclusion

Experts disagree on whether computer crime is a serious problem. According to Donn Parker, "the only safe computer is one that's not used." In contrast, John Taber feels that "computer crime is insignificant... computers should minimize the incidence of crimes such as fraud and embezzlement". A recent survey by the American Bar Association, however, lent support to the belief that computer crime deserves increased attention. The survey indicated that almost one-half of the respondents had been victims of electronic lawlessness in the preceding year. Twenty-five percent claimed that their losses ranged from $2 to $10 million yearly. In addition, several unique characteristics of computer crime distinguish it from conventional crime. Advanced technology has brought the crime of the future to the present.

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Illinois Business Indexes

This issue of the *Illinois Business Review* highlights consumer price indexes. Six graphs are presented for the five North Central US indexes in addition to the Chicago, Illinois CPI. These six graphs, rather than showing index levels, show bimonthly percentage changes except for the Chicago CPI, which shows monthly percentage changes.

The five North Central indexes show declines for February and April. The Chicago index also shows a decline for roughly the same period. Even more important, these are the first significant monthly declines in the indexes for several years. For example, the Chicago and North Central indexes last fell at the

end of 1984. However, these were very slight declines. The North Central index (population greater than 1,250,000) last fell in December 1984 but only by .12 percent. In its ten year existence the North Central index (population 385,000 to 1,250,000) had never declined prior to August 1985. The North Central index (population 75,000 to 385,000) had only declined twice prior to August 1985. The index fell by .48 percent in December 1984 and by .26 percent in February 1983. The North Central index (population less than 75,000) had not fallen significantly since December of 1982 when it fell by 1.4 percent.

Illinois Business Indexes

	Percent Change July 1985- July 1986	July 1986	June 1986	May 1986	April 1986	July 1985	June 1985
Coincident Indicator (1969 = 100)	5.34%	128.92	128.20	126.28	124.70	122.39	122.80
Employment-manufacturing (in thousands)ᵉ	0.89%	960.3	961.3	959.1	964.4	951.8	959.4
Average weekly hours-manufacturingᵉ	1.49%	40.8	40.8	40.7	40.7	40.2	40.7
Weekly earnings-manufacturingᵉ	3.84%	$433.70	$432.07	$431.42	$431.01	$417.68	$423.28
Help wanted advertising-Chicago (1969 = 100)ᵃ	1.98%	103	101	86	94	101	99
Help wanted advertising-St. Louis (1969 = 100)ᵃ	−2.99%	65	70	65	65	67	73
Retail Sales (in millions)ᵇ	−0.95%	$5,299	$5,458	$5,720	$5,288	$5,350	$5,347
Coal production (in thousands of tons)	1.99%	4,355	5,325	5,456	5,866	4,270	4,750
Petroleum products (in thousands of barrels)ᵉ	−6.93%	2,350	2,175	2,267	2,376	2,525	2,445
Vendor performanceᵍ	22.73%	54.0%	50.0%	55.0%	50.0%	44.0%	44.0%
Building permits (in thousands)							
Residential housing units	12.43%	4.992	5.141	6.093	6.362	4.440	4.012
Value of Residential housing	39.26%	$345,144	$320,542	$374,180	$374,451	$247,850	$223,064
Value of nonresidential construction							
Industrial buildings	6.42%	$36,706	$27,825	$49,990	$21,912	$34,493	$28,321
Office, banks, and professional buildings	−72.28%	$33,019	$38,042	$29,418	$32,654	$119,121	$22,439
Stores and other mercantile buildings	32.87%	$41,720	$31,538	$44,558	$36,378	$31,400	$17,680
Other	10.34%	$5,600	$7,953	$2,782	$3,903	$5,075	$6,273
Consumer price index (December 1977 = 100)							
North Central USᶜ	1.09%	—	176.1	—	173.9	—	174.2
North Central/population more than 1,250,000ᶜ	1.52%	—	180.3	—	177.8	—	177.6
North Central/population 385,000 to 1,250,000ᶜ	0.87%	—	174.1	—	172.1	—	172.6
North Central/population 75,000 to 385,000ᶜ	0.65%	—	170.7	—	168.5	—	169.6
North Central/population less than 75,000ᶜ	0.53%	—	171.3	—	170.0	—	170.4
Chicago (1967 = 100)	2.07%	331.1	330.4	324.2	323.7	324.4	324.1
St. Louis (1967 = 100)	1.78%	325.6	—	318.6	—	319.9	—
		1986:1	1985:IV	1985:III	1985:II	1985.1	1984:IV
Personal income (in millions)ᵈ ᵉ ᶠ	4.81%	$169,220	$169,938	$165,608	$164,481	$163,275	$162,133
Per capita personal incomeᵈ ᵉ ᶠ	3.79%	$14,477	$14,550	$14,189	$14,103	$14,009	$14,018

ᵃThe Conference Board, *Help Wanted Advertising*, July 1986 ᵇLatest month projected by BEBR. ᶜPercent change between June 1985 and June 1986.
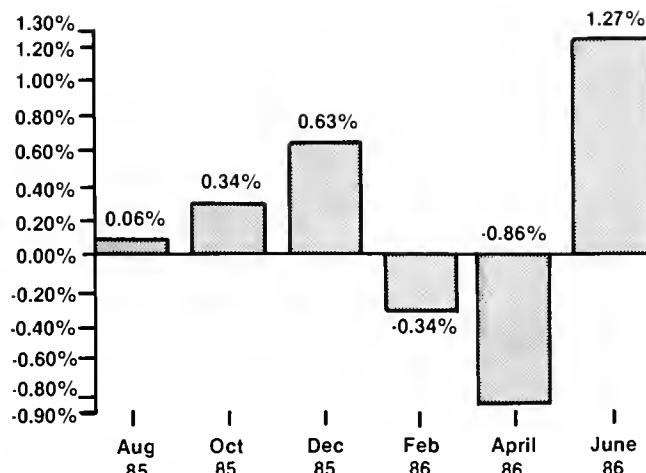ᵈPercent change between 1985 I and 1986 I ᵉRecent month is preliminary figure. ᶠSeasonally adjusted at annual rates. ᵍPercentage of companies receiving slower deliveries.

Changes in Various Consumer Price Indexes (monthly for Chicago, for all others, bimonthly)
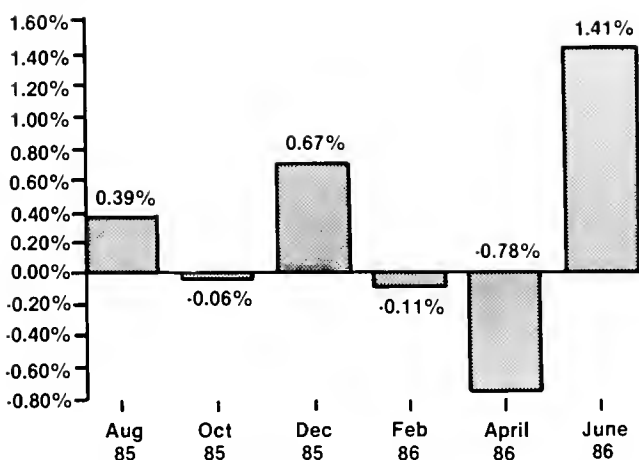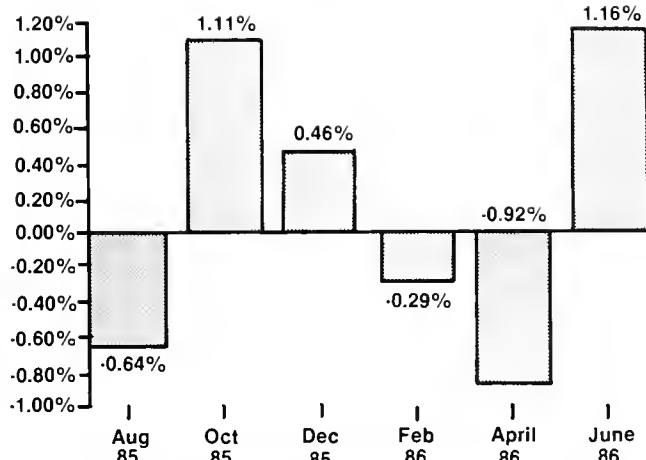
Chicago (1967 = 100)

0.46% 0.12% -1.13% 0.50% 0.52% 0.12% 0.03% -0.77% -0.06% 0.15% 1.91% 0.21%

Aug 85 Sept 85 Oct 85 Nov 85 Dec 85 Jan 86 Feb 86 March 86 Apr 86 May 86 Jun 86 July 86

North Central US (December 1977 = 100)

0.06% 0.34% 0.63% -0.34% -0.86% 1.27%

Aug 85 Oct 85 Dec 85 Feb 86 April 86 June 86

North Central US—Population over 1,250,000 (December 1977 = 100)

0.39% -0.06% 0.67% -0.11% -0.78% 1.41%

Aug 85 Oct 85 Dec 85 Feb 86 April 86 June 86

North Central US—Population 385,000 to 1,250,000 (December 1977 = 100)

-0.64% 1.11% 0.46% -0.29% -0.92% 1.16%

Aug 85 Oct 85 Dec 85 Feb 86 April 86 June 86

North Central US—Population 75,000 to 385,000 (December 1977 = 100)

-0.29% 0.59% 0.82% -0.64% -1.12% 1.31%

Aug 85 Oct 85 Dec 85 Feb 86 April 86 June 86

North Central US—Population less than 75,000 (December 1977 = 100)

0.18% 0.53% 0.58% -1.10% -0.41% 0.76%

Aug 85 Oct 85 Dec 85 Feb 86 April 86 June 86

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Illinois Business Review

Illinois Economic Outlook

Illinois Personal Income (Millions of Dollars, Seasonally Adjusted Rates)

	(1)	(2)	(3)	History				Forecast			
				85:II	85:III	85:IV	86:I	86:II	86:III	86:IV	87:I
Total	173,206	169,220	−2.30	165,481	165,219	169,625	169,220	168,743	170,393	173,106	175,344
Total, Private Nonagricultural	103,896	103,712	−0.18	100,020	101,053	102,608	103,712	103,944	105,269	107,083	108,475
Mining	1,116	1,043	−6.54	1,172	1,129	1,103	1,043	1,070	1,030	993	978
Construction	6,116	5,711	−6.62	5,917	5,967	5,917	5,711	5,965	6,073	6,145	6,194
Manufacturing	29,386	28,426	−3.27	28,579	28,149	29,087	28,426	28,514	28,822	29,092	29,254
Nondurable Goods	10,967	10,728	−2.18	10,637	10,633	10,876	10,728	10,725	10,904	11,057	11,168
Durable Goods	18,419	17,698	−3.91	17,942	17,516	18,214	17,698	17,789	17,918	18,035	18,086
Transportation and Utilities	10,011	9,837	−1.74	9,493	9,868	9,916	9,837	9,772	9,784	9,927	10,037
Wholesale Trade	10,278	10,281	0.03	9,903	9,993	10,116	10,281	10,394	10,560	10,734	10,914
Retail Trade	10,771	10,589	−1.69	10,341	10,612	10,563	10,589	10,766	10,954	11,126	11,294
Finance	9,990	10,555	5.66	9,403	9,516	9,792	10,555	10,731	10,880	11,177	11,375
Services	26,289	26,928	2.43	24,839	25,503	25,785	26,928	26,732	27,165	27,889	28,429

(1)–Last Forecast for 1986:I. (2)–Historical Value for 1986.I. (3)–Percentage Error in Forecast.

Illinois personal income showed a slight dip of .24 percent in the first quarter of 1986, according to figures released by the Bureau of Economic Analysis. However, total nonagricultural personal income for the state had a 1.1 percent upturn in 1986:I, with most of the credit going to strong advances in the finance (7.8 percent) and service (3.7 percent) sectors. On the other hand, mining personal income fell by 3.5 percent, construction by 3.5 percent, and manufacturing fell by 2.3 percent. The Illinois Econometric Model performed well in terms of total personal income for the first quarter of 1986, with a forecasting error of 2.30 percent (an overestimate). However, there were larger errors in the mining (6.54 percent), construction (6.62 percent), and finance (5.66 percent) sectors. The model predicts better news for the last half of this year and the first quarter of 1987. As the graph shows, the growth rates of personal income will be between 1 percent and 1.6 percent per quarter over these three quarters.

Illinois Personal Income Growth Rates (in percentages)

Illinois
Business

Review

WILLIAM R. BRYAN AND DEBORAH MUSTELL

The Rise and Fall of the Dollar

The tremendous rise in the value of the dollar in the early 1980s and its subsequent fall have elicited consternation from leaders in the United States and abroad. The dollar's rise began in mid-1980 and continued until 1985, increasing about 63 percent on a trade-weighted basis (see Chart 1). Following this increase, there has been a marked depreciation of the dollar, a decline of 22 percent.

This article presents a discussion of theory and contemporary facts relating to exchange-rates. First, there is a discussion of the theory of exchange rate determination. Next, the explanatory power of the theory is evaluated during two recent periods, one when the dollar was increasing, the other when the dollar was falling. Following this, the costs of an over-valued dollar are discussed from the viewpoints of the United States and of the world. Finally, there is a discussion of the adverse effects of a "too rapid" fall of the dollar.

Exchange Rate Theory

An exchange rate is simply the price of a foreign currency. In evaluating the supply and demand factors affecting the domestic price of a foreign currency, it is not surprising that important characteristics of a domestic economy are compared to corresponding characteristics in foreign economies. The characteristics toward which attention is focused typically include income growth, money growth, inflation rates, and interest rates.

Unfortunately, exchange rate theories are not unambiguous in their specification of the way these characteristics affect the domestic prices of foreign currencies. Higher rates of income growth in the United States could either increase or decrease the value of the dollar. For example, if US income growth is high, American investors may tend to retain funds in US markets to finance expanding expenditures. Otherwise, those funds might have moved to foreign markets. As a consequence of the reduced demand for foreign currencies, the value of the dollar in terms of foreign currency will tend to increase.

Alternatively, rapid income growth in the US is likely to induce American consumers and businesses to demand more goods, including imported goods. Thus,

for example, to pay for Japanese imports we must buy yen with dollars, thereby decreasing the value of the dollar relative to the yen.

There is similar ambiguity in the impact of monetary growth on exchange rates. One view emphasizes the prompt effect on the domestic price level of higher domestic money growth. It is argued that rapid monetary growth will lead—via increased domestic inflation—to a decreased value of the dollar in terms of foreign currencies. An alternative view emphasizes the impact on interest rates of an increase in the money supply. According to this argument, rapid monetary expansion will lead to decreases in domestic interest rates. As a result, higher capital investment will be fostered. By virtue of increased capital expenditures, there will be greater productivity, lower domestic prices, and, at length, a higher dollar. Note that in either view the effect of money on exchange rates operates through money's impact on the price level.

Chart 1.
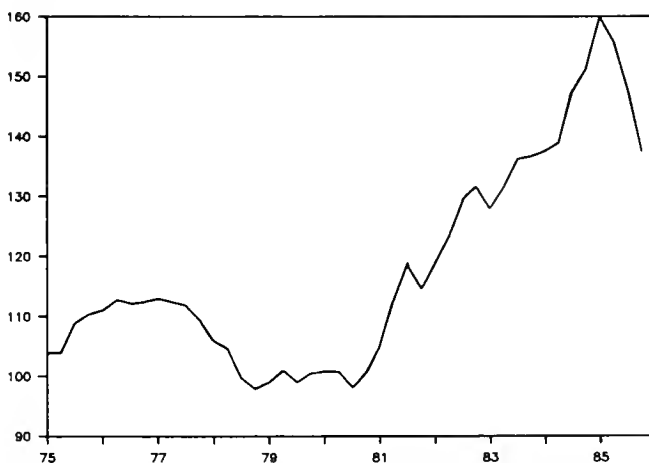
Relative inflation rates, as indicated, are regarded as a major determinant of the value of a currency. Importers and exporters maintain a condition referred to as purchasing power parity. If inflation in the United States is higher than in a certain given foreign country, a foreign importer of US goods would find it necessary to pay more and more to acquire the same quantity of US goods. If there were no inflation, or slower inflation, in the foreign country, domestic goods would become increasingly attractive. They would reduce their imports. But if the price of the dollar in terms of the foreign currency depreciated in value equal to the US inflation rate (or, to be more precise, to the differential in the inflation rates), prices on foreign goods would not show a relative decline.

Finally, interest rate differentials are an often-discussed determinant of exchange rates. It is thought that the main impact of interest rate differentials is on financial flows into and out of the United States. If, for

example, the rate on US three-month Treasury Bills is greater than the rate on comparable securities denominated in three-month sterling, it might be advantageous for a British investor to exchange pounds for dollars and then buy the US T-Bill. Assuming no change in the pound/dollar exchange rate over the three months, the British investor could collect interest paid in dollars, then repatriate to pounds. As long as an investor need not concern himself with future declines in the price of dollars in terms of pounds, there is an incentive to move funds abroad. If the interest rate differential between the US and Britain is greater than the expected decline in the pound price of dollars over the length of the asset, the British investor will choose the US financial assets.

It is possible to buy and sell foreign currencies for future delivery. Continuing the example discussed above, it is possible, and common, for a British investor to buy pounds (sell dollars) for delivery to him at the time the US Treasury bills mature. If he does this he will have locked in the price at which he repatriates his dollars into pounds. But as more and more British investors take this precaution, the price of future pounds is driven higher. As a practical matter, the dollar price of pounds in the futures market will rise to remove the advantage to the British investor associated with the interest rate differential. To the extent that expected depreciation equals the interest rate differential, there is covered interest parity.

Theory vs. Evidence

It is of interest to review experience with a view toward explaining major changes in the price of the dollar during selected periods from 1975 to mid-1986. As suggested earlier, two major movements literally leap out from Chart 1. These consist of the very
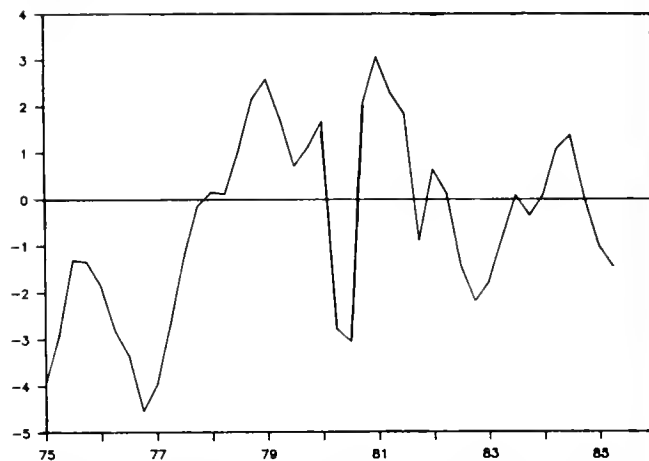
Chart 2.
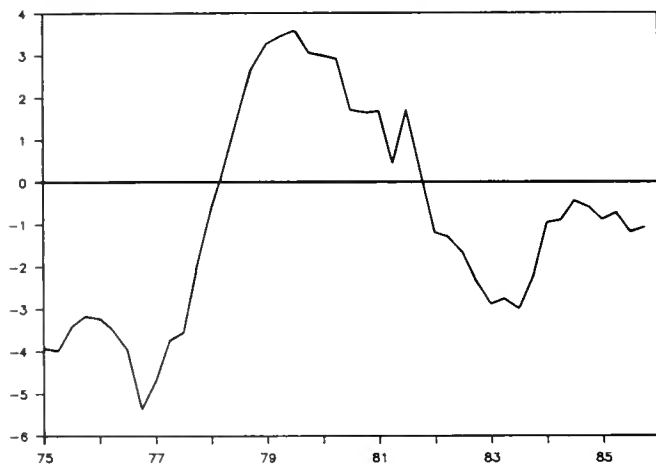
ᵃIn this chart and charts 3–5, the weights were derived by dividing average trade volume in each country by the total average trade volume of these five countries. Inflation is measured by quarterly, year-over-year changes in the Consumer Price Index

Source: *International Monetary Fund* data tapes and *International Financial Statistics*, various issues, University of Illinois, Bureau of Economic and Business Research

Chart 3.

ᵃMoney market rate for France, Germany, Italy, Japan; Treasury bill rate for the United Kingdom, the United States. These rates were weighted as described for Chart 2.

Source: *International Monetary Fund* data tapes and *International Financial Statistics*, various issues; University of Illinois, Bureau of Economic and Business Research.

substantial upward movement from 1980 to early 1985, and the subsequent sharp decline. Each of these periods is discussed with an eye towards evaluating the contributions of the quantifiable determinants discussed above.

Chart 2 shows the inflation rate in the United States minus the average of inflation rates of the United Kingdom, France, Germany, Italy, and Japan (weighted by each country's proportion of the total average trade volume of these countries). Beginning in the 1979–1980 period, the differential between US and foreign inflation began to decline. By mid-1981, inflation in the US was lower than the inflation rates of these five countries. As theory would suggest, the decrease in this differential was accompanied by an increase in the value of the dollar (see Chart 1). The US inflation rate differential was at its maximum advantage in early 1983.

The facts relating to inflation rate differentials are not quite so kind in explaining the abrupt fall in the value of the dollar in early 1985 nor the continued sharp decline into early 1986. There was a marked narrowing in inflation differentials from mid-1983 to mid-1984, but the price of dollars did not begin to decline until six months later. Inflation in the United States has remained low relative to the weighted average of these other economies, and has been stable since 1985. Even so, the dollar has continued its downward trend. In short, it is difficult to argue that this variable accounts for recent changes in the US exchange rate.

Chart 3 shows US short-term interest rates minus the short-term interest rates of the five countries studied (weighted as described above). During the 1979–1983 period, the inflation rate was falling relative to the rates of these major economies. The differential between US and foreign interest rates remained generally positive, fluctuating around zero. As a consequence, the differential between real interest

rates—nominal interest rates minus inflation—rose from a generally negative position in the 1978 to early 1980 period to a generally positive position after late 1980. Chart 4 presents this weighted real interest rate differential. For the 1981–1985 period, real interest rates in the United States were higher than those abroad. Such a situation is consistent with enhanced foreign investment in US financial assets and a strong demand for the dollar. Again, reference to Chart 1 shows that the value of the dollar did increase as our interest rates (nominal and real) remained relatively high.

Interest differentials, both nominal and real, have fluctuated downward since mid-1984 and mid-1983, respectively. Neither of these declines coincides with the turn-around in US exchange rates.

Finally, beginning with the economic recovery in 1983, real income growth in the United States began rising relative to that of the five major economies studied here. Chart 5 presents the change in real GNP in the United States minus the weighted real growth rates in Germany, France, the United Kingdom, Italy, and Japan. The last upswing has been faster and more sustained than recovery in these countries, as shown by the positive real growth differentials. Improved domestic investment opportunities associated with the higher relative income growth in the United States may have served to divert funds away from foreign investment. In addition, foreign investors may have been attracted to a high-growth US economy. In combination, such factors contribute to an increase in the value of the dollar. As will be discussed later, the shift of funds to the United States on capital account is necessarily associated with a deterioration of the US trade balance.

There are determinants of exchange rates that are not readily quantifiable. During 1984, the value of the dollar remained high even though most of the differentials mentioned earlier had fallen. This

Chart 4.
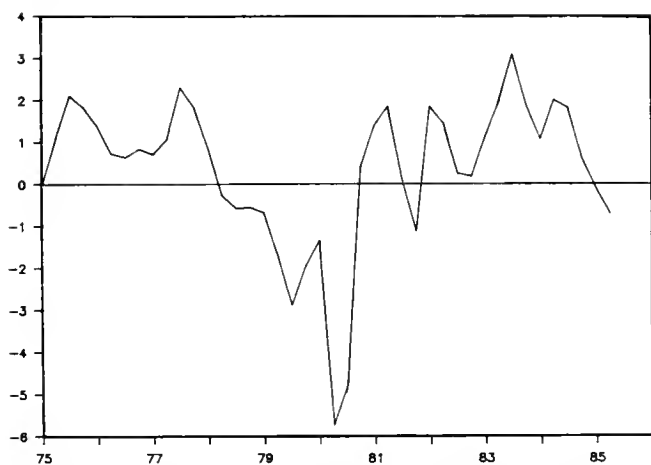
[a]Real interest rates were calculated by subtracting inflation (as measured for Chart 2) from the short-term interest rates used in Chart 3. These were weighted as described for Chart 2.

Source: *International Monetary Fund* data tapes and *International Financial Statistics*, various issues, University of Illinois, Bureau of Economic and Business Research

Chart 5.
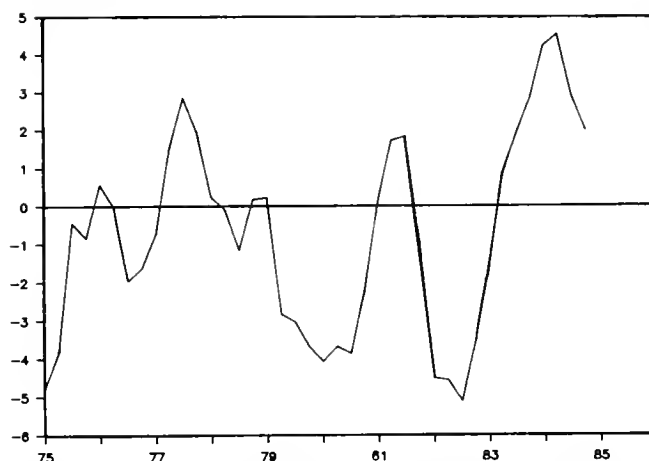
[a]Real growth is the quarterly, year-over-year change in real income (1980 = 100). GNP and GNP data are seasonally adjusted annual rates. GNP used for Germany, Japan, and the United States; GDP for France, Italy, the United Kingdom. These were weighted as described in Chart 2.

Source: *International Monetary Fund* data tapes and *International Financial Statistics*, various issues, University of Illinois, Bureau of Economic and Business Research

situation could have resulted from a perception that US financial assets are less risky than those in other countries. It is argued that the United States is widely regarded as a safe haven—a no-risk place to invest funds.

Effects of an Overvalued Dollar

There is a view that the dollar has been overvalued for many of the past several years. As Chart 6 shows, US exports minus US imports as a percent of GNP began falling more steeply after 1983 when the value of the dollar kept increasing. Even while this was occurring, it was argued that, at length, the value of the dollar would fall. Indeed, it was argued that it would fall as a consequence of this imbalance, thereby increasing exports and decreasing US import demand. If so, the process will have been self-correcting. Nonetheless, there are real costs to our society of this overvaluation. US industries that depend on foreign demand or that compete with foreign substitutes—such as agriculture, forestry products, mining, and many in manufacturing— have experienced unemployment of labor and capital equipment. Beyond that, foreign competition has invaded US markets traditionally dominated by domestic industry—such as autos. To reemploy these resources is not costless. It requires retraining of personnel, relocation of people and machinery, refitting of equipment (if possible), and construction of new equipment. The high unemployment experienced in the "Rust Belt" states of the upper Midwest may have resulted, in part, from the high value of the dollar.

There are beneficial aspects of a highly valued dollar. A movement of funds into the US on capital account can be diverted to several uses. Foreigners may invest in short- or long-term financial assets—or, a capital account inflow can take the form of long-term fixed
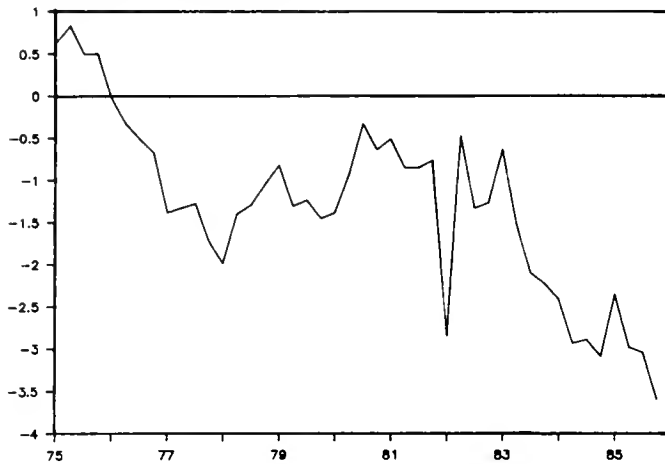
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Chart A. United States

Chart D. Italy

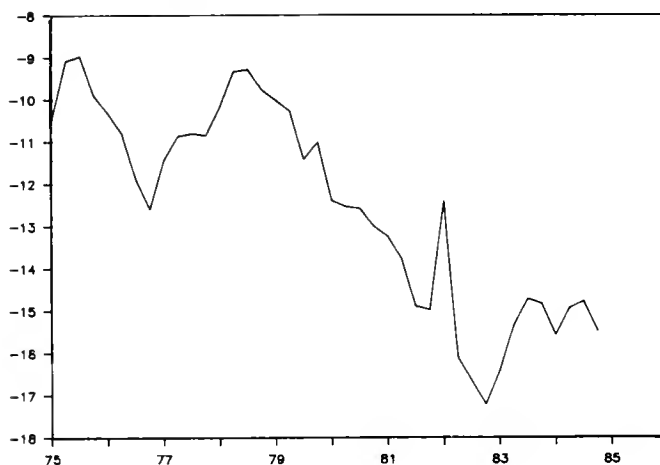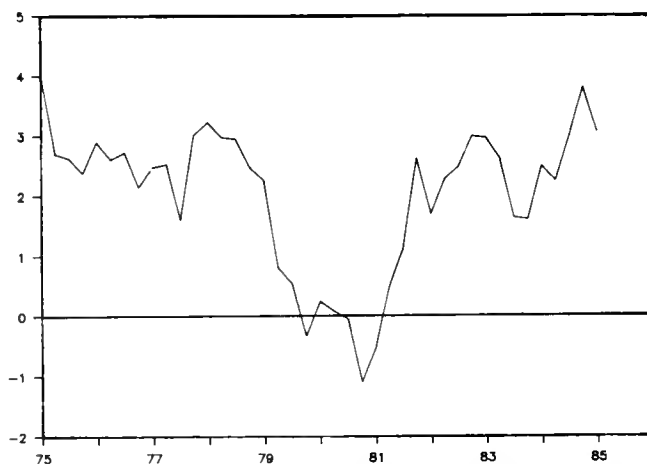## Chart B. France

Chart E. United Kingdom

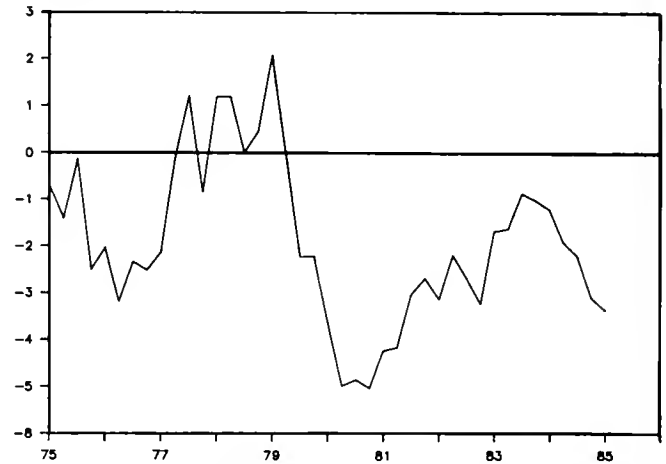## Chart C. Germany
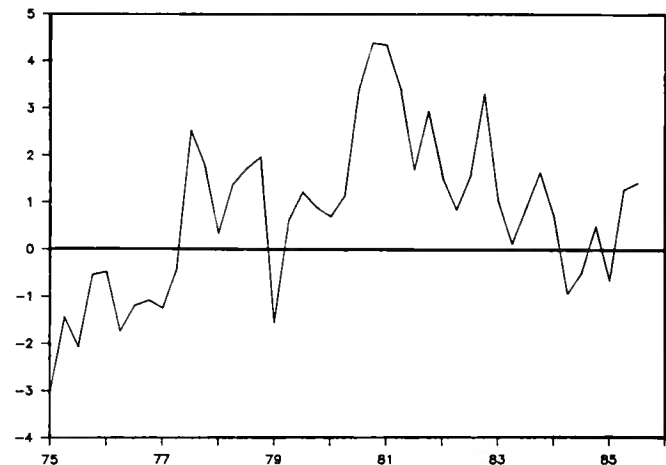
Chart F. Japan
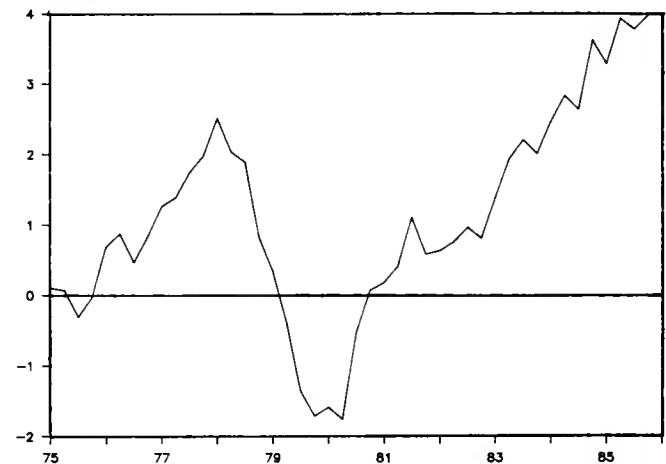
investment. Such choices can have an important effect on the future of the economy.

For example, if Japan uses the dollars it acquires from its export surplus to build a new automobile plant in the US, there will be an increase in this nation's tangible capital stock, plant and equipment, albeit

Source: *International Monetary Fund* data tapes and *International Financial Statistics,* various issues; University of Illinois, Bureau of Economic and Business Research.

owned by foreigners. This will create new jobs to produce goods, and thus benefit the US economy. Further, if the Japanese investors decide to leave the

US market, they cannot just move the plant back to Japan.

But, there is a view that much of the capital inflow in recent years was used to finance the federal budget deficit. Some argue that foreign funds invested in such debt can lead ultimately to problems. If, en masse, foreigners subsequently decided they no longer wanted to hold the Treasury Bills they could sell them in large blocks, thereby driving the price of the Bills down and yields up. It is important to point out that such developments can affect any financial asset—common stock, government or corporate bonds. Nor does who does the buying or selling make much, or any, difference. Any attempt by US citizens or noncitizens to liquidate holdings of financial assets would have similar effects on the market— prices would tend to fall and yields would increase. In the end, all assets are always held by someone; efforts to shift from them will tend to drive prices down, and conversely. Regardless of the source of the liquidation, the resulting increase in interest rates can have adverse effects on the economy.

In a somewhat different vein, it is argued that problems will emerge when (if) the capital inflow slows or stops. Following such a development, there will need to be a time of austerity—by both the federal government and consumers. It will be necessary to repay the foreigners by exporting more than we are importing, thereby reducing the future consumable product of the United States. Presumably, to stretch out the logic of this argument, we would be better off to export more currently, thereby reducing the consumable product now.

From a European or Japanese viewpoint a high dollar can be regarded as desirable or undesirable, depending upon the context within which it is considered. Because more European or Japanese exports are demanded by the United States, the economies of these countries are stimulated. But many of their imports (especially petroleum) are denominated in dollars. If the value of the dollar is high, they must pay more of their currency for the oil they import; thus, their inflation rate may increase.

Effects of a Falling Dollar

Some have defined a "too rapid" fall of the dollar as more than 10 percent in one year. The dollar has fallen by about 22 percent on a trade- weighted basis since early 1985, which worries policymakers in the US and abroad for a number of reasons. First, a rapid decline in the dollar could cause investors to lose confidence in dollar- denominated assets. As discussed above, if that happened and they sold these financial assets, interest rates could be driven higher.

Pressing this argument further, it is suggested that higher interest rates might tend to reduce fixed investment and consumer demand, possibly contributing to a recession in the United States. Whatever the underlying merit of the argument, so far these developments do not seem to have occurred. Interest rates in the United States have not risen; they have declined.

A second line of argument suggests that a rapidly falling dollar could reignite US inflation as the cost of imports increases, triggering increases in prices of domestically produced goods competing with those imports. This fear, too, does not yet seem to be borne out. Inflation in the US has remained low.

Finally, and most important from the viewpoint of our trading partners, a decline in the value of the dollar is expected to bring about an eventual decrease in demand for imports into the United States. As our trade deficit falls—because of declining imports and rising exports—our trade partners' corresponding trade surpluses are expected to shrink. US demand for foreign goods helps to keep the world economy growing, and a decrease in this demand has a major impact on these separate economies. Furthermore, many developing countries have relied on trade surpluses with the United States to finance external debts. With a fall in the demand for their exports, these countries could experience debt crises similar to those experienced by other developing nations.

There is also a bright side to a lower dollar. As indicated, it is anticipated that the United States will import fewer goods and United States consumers will demand domestically produced substitutes. At the same time, the United States is expected to export more as US prices become relatively cheaper to consumers abroad. Such developments would tend to help national income and employment. In contrast, protectionist measures recently discussed in Congress are costly to US consumers and foreign relations. Hopefully, such pressures will wane as the dollar moves lower and US industry becomes increasingly competitive.

Conclusion

This article has discussed alternative theories on the behavior of exchange rates and has tested the ability of those theories to explain economic events against the experience of the 1980s. The exchange rate theory sketched here is limited in its ability to explain the empirical experience of the current decade. In part, the weakness of the theories may lie in their exclusion of unmeasurable factors affecting the value of the dollar.

Arguments were presented that marked and sustained movements in exchange rates can be detrimental to the economy. The transition costs of pronounced and prolonged movements in exchange rates force difficult adjustments on various sectors of the economy. There is a widely held view that more rapid, self-correcting adjustments would serve to decrease transition costs. Alas, rapid, self-correcting adjustments have not occurred. But it is hoped that the decline in the dollar over the last 18 months will succeed in reversing the adverse consequences of previously experienced overvaluation. If so, it can help the United States and, therefore, the world economy. It is plausible to hope that the devaluation can bring the parts of the whole into a better balance, thereby fostering an increasingly stable situation.

JAMES R. MOORE

Secondary Coal Recovery:
A New and Struggling Industry

Refuse surrounding active and abandoned coal mines in the state of Illinois contain waste volumes ranging from a low of 20 tons to a high of 20 million tons. Collectively, the Illinois coal waste deposits (resulting from inefficient cleaning methods of the past) contain an estimated 500 millions tons of refuse. Research indicates that, on the average, 26 percent of the waste is coal. Thus, the Illinois deposits contain over 125 million tons of coal, which equals two years of current Illinois coal production, and, at current prices, represents a value of $3.2 billion.

Secondary Coal Recovery Prior to 1980

Although major coal companies began recovering coal fines (28 mesh and below) in the late 1940s, serious commercial efforts directed at recovering coal from gob deposits (mine waste containing coal above 28 mesh in size, rock, pyrite, wood, metal, paper) in the state of Illinois did not begin until the 1970s. Efforts at that time were concentrated in the counties of Williamson, Saline, and Franklin in Southern Illinois. While these early recovery efforts indicated some opportunities for handsome profit, operators were plagued with the crucial problems of inexperience, inadequate funding, a reduced coal market, inefficient processing equipment, a lack of planning and marketing know-how, and meeting the newly imposed permitting requirements of the "Surface Mining Control and Reclamation Act of 1977." The pioneering firms in this new and struggling industry were small and, by and large, lacked the ability to deal effectively with the problems. Economic data compiled on the early secondary coal recovery operations point up the problems.

Plant Efficiency

In 1979, I surveyed the operating secondary coal recovery plants in Franklin, Williamson, and Saline counties under a grant from the Coal Extraction and Utilization Research Center at Southern Illinois University. Data in Table 1 highlight efficiencies of the seven plants. Analysis indicate efficiency variation

from 33 percent to 80 percent of the possible feed capacity. Differences are explained by variations in the feed material, experience of the operators, and the processing equipment. The average plant was producing at a rate of about 260,000 tons of clean coal per year.

Six of the seven operators in the three-county study used the auger flotation process for separating the coal from refuse, and one used cyclones. The auger operation used vibrating screens for drying and the cyclone products were dried in centrifuges. Reject material from the auger flotation plants contained 40 percent coal, most of which was less than 28 mesh, and the cyclone plants' reject material contained less than 5 percent coal. The average recovery rate of all plants was 26 percent.

Investment and Operation Cost

Plant investments ranged from $90,000 to $1.2 million, and no correlation exists between investment and profit margin (see Tables 2 and 3). Royalties paid on the finished product ranged from $1.50 to $4.00 a ton, but the higher price was paid between two companies that were owned by the same principals. The length of life of a secondary coal recovery plant is limited because after the gob pile is processed the operator usually moves on to another site or goes out of business. Transporting raw materials to a cleaning plant is normally not economical, although two of the plants moved their gob eight miles at a cost of $4.50 a ton. The average length of operation in this survey was 2½ years. One plant operated three shifts, one operated two, and the other five operated single shifts. The average crew for a shift comprised three men and a supervisor, and they lost one hour a shift for repairs. A crew needed a minimum of one loader-scraper, two end-loaders, a dozer, and a backhoe to operate a recovery plant.

Lessons from the 1970s

All gob processing plants constructed during the decade of the 1970s were either salvaged or abandoned by 1981. Secondary coal recovery operators learned several important lessons during this early stage of experimentation. Market needs should be carefully analyzed, and the best marketing strategies for satisfying those needs should be determined. Technology used for separating coal from other gob materials was not cost- and quality-efficient. Needs for operating capital should be determined using long-range planning techniques. A careful selection of employees and providing adequate training are necessary for insuring proper maintenance and continuous output. Cooperative relations should be maintained with the Department of Mines and Minerals and the Environmental Protection Agency.

Secondary Coal Recovery: 1980–1985

Knowledge and experience gained by secondary coal recovery pioneers of the 1970s ushered in new investors, more sophisticated technology, and

Table 1.

Plant	Estimated feed capacity in tph	Average feed capacity in tph	Average finished product in tph	Finished Product Analysis			
				Btu	Moisture %	Ash %	Sulphur
A	120	40	12	12,000	9	9	2.5
B	35	20	6	11,400	9	9	2.8
C	300	120	28	10,600	12	12	.85
D	300	112	25	11,500	9	14	2.68
E	100	80	16	11,500	10	10	.85
F	100	60	18	9,260	18	13.9	1.02
G	120	80	24	10,483	12.8	12	.89

Table 2.

Plant	Investment in plant and equipment	Average processing cost per ton of recovered coal	Available colliery reject owned or under contract	Purchase price if owned	Royalty fee for product
A	$1,200,000	$18.00	300,000 tons		$3.00/ton
B	90,000	8.00	2,500,000	N/A	
C		14.00	1,500,000		$4.00/ton
D	375,000	6.00	1,500,000		10%
E	500,000	20.00	4,000,000		$1.50/ton
F	275,000	15.00	640,000	$52,000	
G	800,000	15.00	660,000	$53,000	

Table 3.

Plant	Potential Annual Product in tons	Price f.o.b. Mine	Gross Sales	Total Costs	Estimated Potential Profit	Return on Investment Averaged over 3 Years
A	25,200	$22.50	$ 567,000	$ 529,000	$ 37,800	9%
B	6,300	25.00	157,500	50,400	107,100	357
C	88,200	18.75	1,653,750	1,587,600	66,150	316
D	26,250	20.00	525,000	210,000	315,000	252
E	16,800	20.00	336,000	361,200	−25,200	loss
F	18,900	20.00	378,000	283,500	94,500	104
G	25,200	20.00	504,000	378,000	126,000	47

Table 4.
A Comparison of Secondary Coal Recovery Operations in the 1970s with that of the 1980s

Factor of Comparison	Secondary Coal Recovery in the 1970s	Secondary Coal Recovery in the 1980s
Average annual plant tonnage potential	25,000	300,000
Average price per ton	$20 f.o.b. mine	$23 f.o.b. mine
Potential gross sales	$500,000	$6,900,000
Average annual operating costs (including debt service, and reclamation)	$350,000 ($1/ton)	$5,100,000 ($17/ton)
Average potential profit	$150,000	$1,700,000
Average investment per plant	$520,000	$2,100,000
Product quality	Inconsistent	Relatively Consistent
Industry image	Poor-Fair	Fair-Good
Market	Industrial - Utility	Industrial - Utility Government Agencies
Management orientation	Production	Production - Semi-Marketing

experienced employees in the 1980s. Three new $1.5 million plants consisting of a combination barrel washer, multi-stage cyclones, centrifuge dryers, sizing screens, radial stackers, and computerized control systems began production during the summer of 1982. The new plants were designed to be cost and quality efficient. Another similar plant was brought on line in 1984. One new auger flotation plant was completed in 1981, and a new diester plant was completed in 1983. One of the plants abandoned in 1980 was modified and readied for 1985 production. A new plant incorporating the most advanced technology is scheduled for completion this year. The new plant to be located in Williamson County will use heavy media, multi-stage cyclones. While this new activity suggests industry growth, operators continue to be troubled with the same problems of the 1970s.

A comparison of secondary coal recovery operations in the 1970s with those of the 1980s show the changes (see Table 4). Production capacity of the new plants is 12 times that of earlier counterparts. The increased volume affords owners the opportunity to bid on larger-size contracts. Because of relatively easy adjustments through computerized and manual techniques, the most important characteristic of the new technology is the ability to produce a more consistent quality. This attribute overcomes the buyers' major criticism of earlier operations and should serve to improve the industry's image. Further analysis indicates a 5 percent increase in price, a 1,100 percent increase in production potential, a 20 percent increase in costs, a 300 percent increase in investment, and a 100 percent increase in return on investment. One might conclude that secondary coal recovery is an attractive investment. However, evidence of the past suggests that the inexperienced should approach the industry with extreme caution.

Toward the Future

In 1984, the small and struggling secondary coal recovery industry accounted for an estimated .003 percent of total US coal production. At that rate, it will take the industry 500 years to recover the coal from existing refuse deposits. Growth, and even survival, of the industry will depend on the operators' ability to deal with two major obstacles. First, there are the high and sometimes restrictive entry and exit costs imposed by federal and state regulations. Second, the mandate by the government to reclaim all abandoned mine sides. This program, which is administered by the Abandoned Mine/Land Reclamation Councils in the respective states, calls for covering the gob deposits with sufficient enough dirt for sustaining a permanent vegative cover. For example, the state of Illinois is spending approximately $14 million annually. Funding for this program comes from taxing underground mines 15 cents/ton and surface mines 35 cents/ton. Removing the dirt will add additional costs to the secondary coal recovery operation.

Recommendations

Scientific research data is vital to improving processing efficiencies. Coal recovery from colliery reject deposits is a new industry and deserves immediate professional and scientific attention. Land reclamation, employment opportunities, business profits, and providing a valuable energy resource are basic benefits to be derived. Optimum achievement of these benefits calls for orderly growth and development of the secondary coal recovery industry.

Specific needs include (1) the establishment of a secondary coal recovery council comprised of one representative from each coal-producing state. Authority and resources should be given the Council for awarding research grants, processing and forwarding small business loan requests to appropriate agencies on behalf of qualified secondary coal recovery operators, establishing and maintaining a strong monitoring and accounting program, and promoting the secondary coal recovery industry; (2) initiating product planning research, which includes marketing, purchasing, engineering, production, design, and finance expertise; (3) developing an abandoned mine directory giving location, owner's name and address, quantity, and quality of colliery reject; and (4) conducting a market segmentation study for establishing optimum use and profit potential for secondary recovered coal.

Cooperative efforts is needed. Major coal companies, coal research centers, coal associations, and the Department of Energy are basic constituencies that must work together toward making secondary coal recovery a dynamic and successful industry.

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The Effects of Size and Tenure on Farm Efficiency

In the history of agriculture, two issues have cropped up with considerable regularity, and are still very much alive today. The first relates to whether large farms or small farms are more efficient. The second issue concerns the most productive forms of tenancy, that is ownership, rental, or share-leasing. This study addresses these issues in the context of Illinois agriculture, applying methods established by earlier researchers to Illinois data.

Two features of the data are distinctive. First, the data include experience from four years. Such data permit tests for the stability of established relationships over time. Second, the data depict experience from a large sample; in a given year there were over 650 farms in the data base.

The study is divided into two parts. In the first part, there is an examination of the efficiency of the sample Illinois farms across large and small farms and between different tenure types. In the second part, there is an investigation of the primary determinants of the decision to lease land (in or out).

The Data

The data stem from a subset of farms from the Illinois Farm Business Records. These records are kept in cooperation with the Illinois Farm Business Management Association and the Department of Agricultural Economics at the University of Illinois. The data are for the years 1980–1983, consisting of farms with usable records for both the tenant and landlord. The data are obtained from the farm business records of about 500 Illinois farms for each of the years. The farms are located in the counties of Adams, Boone, Brown, Bureau, Carroll, Cass, Champaign, Clark, and Coles in northern and central Illinois. These counties are well dispersed, so we can reasonably hope to average out local effects. The Farm Business Records data base is not itself a random sample. Hence, there was no effort made to pick a sample using randomization procedures. Instead, the data choice was associated with various fieldmen who were spread out over North-Central Illinois.

The farms can be cross-classified according to both ownership and forms of tenure. There are three categories of owners: pure owners, who own all the land they farm; part-owners, who lease part of the lands they farm; and pure tenants, who lease practically all the land they farm. The pure owners, who were dropped from further consideration, formed about 15 percent of the sample. There are various tenure forms, including mixed arrangements for dairy farming and other types of livestock farming. To increase homogeneity, the sample was limited to the records of crop farmers with crop-sharing (on a 50–50 basis) and cash renting. The categories consisted of (1) part-owner crop-share, (2) part owner cash lease, (3) pure tenant crop-share and (4) pure tenant cash lease.

There was an important study of the relative efficiency of large versus small farms, as well as the effect of different leases upon agricultural efficiency (with emphasis upon the former). This study was based on data from a sample of Illinois grain farms for the year 1977. Two tentative conclusions were articulated. First, it was found that smaller farms did not show marked signs of inefficiency. Second, it was suggested that farmers who leased land appeared to be more efficient than those who did not. The importance of these findings lends urgency to reexamination of the issues for a large data base and for an extended period of years.

The technical aspects of the study are summarized in the Appendix. We find considerable evidence to confirm the results discussed above. In particular, there is little sign of increased efficiency on the part of farms over 500 acres. However, we find that the superior efficiency of leasing is visible only for 1980 (and perhaps 1981). It would appear that the considerable economic distress of the years 1980–1982 served to weed out the owner-operated farms that were not relatively efficient. Our results in this area suggest that the earlier work needs to be modified and reinterpreted.

A book about agriculture in India, *Palanpur*, by C. Bliss and N. Stern provides a useful framework and starting point for considering the *short-run* leasing decision. Bliss and Stern argue that tenancy provides a way for those with excess (or deficient) land, labor, and equipment to find mutually advantageous bargains. Someone who has more power or equipment than can be used on his own fields will look around for land to cultivate and those who lack skill or desire to cultivate their own lands will want to rent out their lands to such people. Both farming ability and power or equipment are inputs that can be considered as fixed in the production process.

The tenancy decision is essentially one of finding the optimal combination of variable inputs to maximize profits. In the Indian context, it was relatively easy to pinpoint the critical fixed inputs. Social norms enforce the working of the family as a unit. Within this context, it makes good sense to think of farmers wishing to cultivate amounts of land that provide employment for the entire family. By the same token, bullock-power is a critical source of power, without which successful cultivation simply cannot go on. To assess by analogy that similar factors should also count in the United States perhaps requires no further explanation. The family may play an equally important role in Illinois agriculture. Also, in view of the large extent to which Illinois farms are mechanized, it is clear that successful cultivation is heavily dependent upon machinery.

The statistical work was designed to test the following proposition: The amount of farm land leased is positively related to the capital equipment owned and the amount of available unpaid labor. But, in

contrast, the amount of land that is leased is negatively related to the amount that is owned.

Our expectation was that capital owned would be as influential in Illinois as it was in *Palanpur*. This was confirmed by the statistical work undertaken with data from all tenure forms. In light of the high degree of mechanization in Illinois, our second expectation was that unpaid labor, a proxy for family labor, would be much less important, or perhaps even insignificant. Somewhat to our surprise, unpaid labor was almost always statistically significant. If our results are substantiated by further research, two interesting results would follow. First, theorists have long worried about the theoretical indeterminacy of the amount of land leased. Our results show that there may indeed be an "optimal" amount of land to lease. Secondly, we see no reason to consider sharerenting as being anything other than a market contract, largely independent of "stages of development." The results of this study suggest a much closer parallel between developed and developing agricultures with regard to the effects of capital and unpaid labor than hitherto has been reported.

There are two general points about the market for farmland that arise from this study. First, leasing is a valuable means of achieving efficient farm organization. Second, it would appear that significant indivisibilities are present in the capital markets. We discuss each in turn.

Farms that are fully owner-operated give indications of being inefficient compared to other lease types. If we examine what has happened in Illinois from the census data on the different lease types, we find some fairly dramatic changes that would corroborate our findings that leasing in some land is more efficient than fully owning only.

There has been a significant increase in the proportion of farmers who are renting additional land (the part-owner operators) from 20.4 percent to 1950 to 36.3 percent in 1982. The total size of farm they operate (both rented and owned) land has significantly increased relative to those who farm only the land they own (full owners). There has been an increase from 227 acres in 1950 to 468 acres in 1982. Given the finite nature of available farmland, as farms increase in size, the expansion must be at the expense of others. Some of the full owner operators have lost out, but the major group of losers is the tenant group, the group that rents all the land they farm.

The full renter is at a distinct disadvantage to the part-owner who has a secure tenure base of operations on his own land. The part-owner can wait and observe when land becomes available for rent and can aggressively bid in the rental market. However, if a full tenant loses his lease, he may need to leave the community to find other land. Alternatively, he may find it necessary to quit farming. Clearly, based on the census data, tenants have been quitting farming.

It has not been possible to account for personal characteristics of the farmers who expand relative to those who do not. There are substantial differences among the rates of expansion among farmers even though they may start out with seemingly the same assets of labor, training, capital, and level of economic efficiency.

In measuring economic efficiency, we have made the usual assumption that the entrepreneur wants to maximize profits. Our findings are based at least in part on this assumption. However, some farmers who speculated on land purchasing rather than on renting or leasing additional land are now concerned with current financial problems. If, because of personality or location within a geographically restrictive leasing and ownership pattern, a farmer views his expansion potential as limited, he may not choose the traditional unrestricted profit maximization approach. Instead, with his limited fixed resources, he may adopt a cost minimization or resource conservation approach. Such constrained behavior will result in inefficiency and may explain part of the differences in efficiency between the smaller owner-operated farms and the larger part-owner farms.

The part-owner farms have been able to expand because expansion through renting additional land (where this is geographically possible) is more profitable for the farmer operator than owning. Such is the case even though, from the standpoint of the whole operating unit, it may be more efficient in terms of variable costs.

A comparison of the rental market for farmland and the ownership market offers some understanding of the situation. The annual rent for farmland, contrary to what we sometimes find with other income-producing real estate, has nearly always been substantially less than the cost of owning farmland on a current account basis. There are several reasons for the willingness of farmers to pay more for land than the current return from rent. Reasons include reduction of tenancy risk, the pure utility of land ownership, and the expectation of increased rent and increased capital value.

During the stable period from 1959 through 1972, the data show that the cost of ownership was about one-third to one-half greater than the cost of rental. During the land boom after 1975, this relationship became quite different and is only now working back toward the longer-term relationship. Setting aside the possibility of a marked and prolonged period of deflation, it is doubtful, given the desire to own land, that the cost of ownership will ever be less than rent.

Whether the apparent inefficiency of owned farms results from the smaller scale at which such farms operate, or whether the seeming inefficiency is compensated for by the benefits of ownership are topics for further consideration.

As suggested, it would appear that there are significant indivisibilities in the capital market. If capital markets functioned smoothly, in the textbook sense of the term, we would not expect capital possessed to influence leasing significantly. Despite the existence of some credit organizations specifically designed to meet the needs of farmers, it would appear that capital is very much a "lumpy" input. This feature

obviously influences the manner of analyzing the Illinois farm economy because it tells us that long-run equilibria, that is with full adjustment, are very seldom reached. It would be useful for policies and prescriptions relating to the structure of the farm economy to take this into account. Needless to say, this is not a totally new point, but it bears repetition in light of our findings.

Appendix

The Garcia, Sonka and Yoo (1982) (GSY) study used a standard profit function that is linear in logarithms for most variables and is based on the assumption of a Cobb-Douglas production function. To enhance the efficiency of estimation, input demand functions are jointly estimated along with the profit function. To allow for correlated errors between equations, Zellner's method of seemingly unrelated estimation is used. The basic idea can be summarized as follows. A linear regression estimates the variable profit per farm as a function of the following variables: (1) a dummy variable for small farms that should have a zero coefficient if there is no difference in the relative efficiency of large vs. small farms (700 acre cutoff); (2) the monthly wage rate for hired labor per farm; (3) total wage bill for hired labor per farm; (4) cash expenditures for variable inputs per farm; (5) months of operator and family labor available per farm; (6) value at nonland capital available per farm; (7) acres per farm; (8) soil productivity index; (9) ratio of soybean to corn acreage; (10) a regional dummy variable; (11) a large farm dummy variable with the same interpretation as (1). The justification for including these variables is quite standard and the reader is referred to GSY for details.

It should be pointed out that, partly for theoretical reasons and partly for practical ones, some of the variables used in the GSY study are excluded in our study. A limitation common to both studies lies in the use of expenditures on variable inputs, a practice that captures both price and quantity effects. Because price and quantity effects can offset or even negate each other, the sign of the regression coefficient on such variables is unclear on a priori grounds. Finally, it should be noted that tests of efficiency between large and small farms will obviously be sensitive to the cutoff point chosen between large and small farms. In the previous study a 700-acre cutoff on the basis of Wilken and Kesler (1978); their hypothesis was tested also for 500 acre and 400 acre cutoff points. The tests appeared to become sensitive at the 400 acre mark. As 1980 and 1981 were very difficult years for farmers it was decided to use 500 acres as the dividing line between small and large farms. For the sake of completeness the second test was run with the 700-acre cutoff point.

Two regressions were run, corresponding to Models 1 and II from the GSY previous study. Model I has already been described above. Model II utilizes a method to take account of ownership. The variable profit per farm is modeled as a function of: (1) the proportion of farm income that is obtained from the operator's own farm; (2) variables 2 through 10 from the previous model. The data were initially tested to see if the profit functions for small and large farms differed only by a multiplicative constant. The data for 1980, 1982 and 1983 passed this test while that for 1981 did not. Hence 1981 was dropped from the sample and examined separately. Our fits are generally reasonable but the sign of Cash Operating Expenses is negative, suggesting that the price effects have outweighed the quantity effects in producing this result. We limited ourselves to tests of relative efficiency. These show that, despite the several adjustments that have been made in these difficult times, there is no evidence that small farms, whether taken at the 500-acre or the 700-acre cutoff point are less efficient than the large farms. The effect of leasing is surprisingly strong in 1980 and 1981 when the t-statistic is highly significant.

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New Publications Soon Available

Available soon from the Bureau of Economic and Business Research, the 1987 *Illinois Economic Outlook* and a new *Illinois Statistical Abstract* containing economic data from 1979–1984.

The 1987 **Illinois Economic Outlook** contains articles on pertinent components of the Illinois economy plus quarterly forecasts of employment, personal income by major sector, and hours worked and hourly wage paid. Articles include population, financial services, manufacturing, employment, real estate, education, transportation, trends in economic development, state revenues and expenditures, exports, agriculture, and Illinois econometric forecast. The cost will be $2.50. The 1986 **Illinois Economic Outlook** continues to be available.

The **Illinois Statistical Abstract** provides over 650 pages of statistics on Personal Income; Transfer Payments; Farm Income; State Taxes; Banking and Prices; Manufacturing (with information on large and small establishments, employers, payroll, production employees, hours and wages for production employees, value added by manufacturer, cost of materials, value of shipments, and new capital expenditures); Service Industries; Building Permits; Employment; Employment, Hours, and Earnings; Labor Force Statistics; and Population. These data will be useful to faculty and students, newspapers, state and local government agencies, businessmen, lawyers, accounting firms, management firms—in short any one seeking market or location information. The book will be available in paperback ($25), and users with heavier analysis demands will be able to purchase the book on diskette ($40).

For further information about these publications, contact the Bureau of Economic and Business Research, University of Illinois at Urbana-Champaign, 1206 South Sixth Street, Champaign, IL 61820 (217-333-2330).

Illinois Business Indexes

Beginning in this issue of the *Illinois Business Review*, two leading economic indicators will replace the coincident indicator in the Illinois Business Indexes. Based on historical evidence, sustained changes in these indicators anticipate future economic developments in the Illinois economy. The leading indicators were developed by the Bureau of Economic and Business Research and were discussed in the October issue of the *Illinois Business Review*. We provide the leading indicators for Illinois to allow readers the opportunity to identify significant changes, thereby providing forecasts of future economic growth or decline.
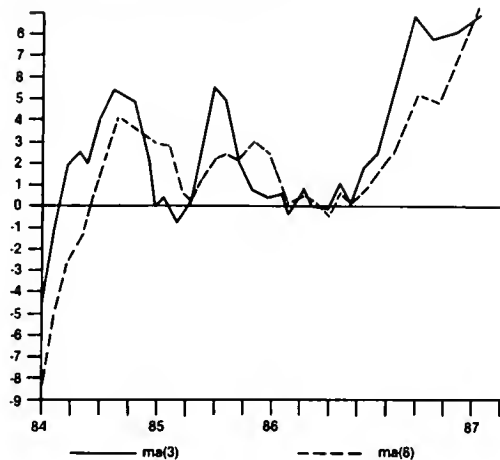
The Illinois economy is expected to grow over the next two quarters. Both leading indicators show an upturn in mid-1986 with the three-month moving average (MA(3)) staying above the six-month moving average (MA(6)) for most of this period. Retail sales have leveled off, with only a slight decrease in September. Personal income for Illinois, both total and per capita, increased in the second quarter of 1986. Finally, manufacturing employment and weekly earnings have remained fairly constant since June 1986, with slight gains in recent months.
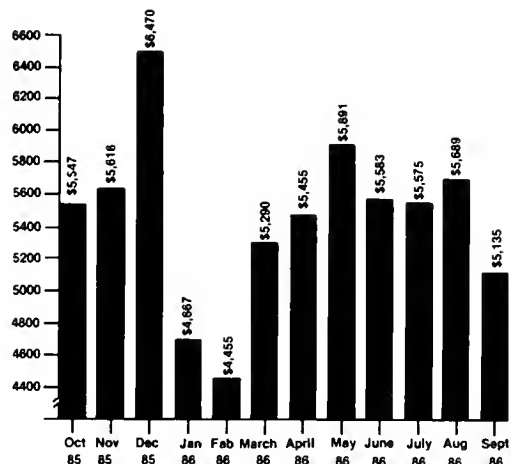
Illinois Business Indexes

	Percent Change Sept 1985- Sept 1986	Sept 1986	Aug 1986	July 1986	June 1986	Sept 1985	Aug 1985
Leading Indicator(MA(3))[h]	8.02[h]	7.53	6.61	6.48	7.79	−0.49	0.25
Leading Indicator(MA(6))[h]	7.62[h]	7.66	6.04	4.61	4.79	0.04	1.06
Employment-manufacturing (in thousands)[e]	1.37%	962.7	960.1	959.9	961.3	949.7	952.4
Average weekly hours-manufacturing[e]	0.73%	41.2	40.9	40.7	40.8	40.9	40.4
Weekly earnings-manufacturing[e]	2.56%	$439.60	$435.18	$433.05	$432.07	$428.63	$420.56
Help wanted advertising-Chicago (1969 = 100)[a]	6.32%	101	100	103	101	95	98
Help wanted advertising-St. Louis (1969 = 100)[a]	−7.46%	62	64	65	70	67	65
Retail Sales (in millions)[b]	−1.57%	$5,135	$5,646	$5,528	$5,524	$5,217	$5,512
Coal production (in thousands of tons)	1.17%	5,254	5,225	4,355	5,325	5,193	5,384
Petroleum products (in thousands of barrels)[e]	−21.38%	2,001	2,017	2,350	2,175	2,545	2,645
Vendor performance[g]	23.81%	52.0%	51.0%	54.0%	50.0%	42.0%	42.0%
Building permits (in thousands)							
Residential housing units	54.81%	5.502	4.326	4.992	5.141	3.554	4.055
Value of Residential housing	72.78%	$359,088	$296,180	$345,144	$320,542	$207,827	$219,135
Value of nonresidential construction							
Industrial buildings	75.97%	$46,663	$20,324	$36,706	$27,825	$26,517	$30,617
Office, banks, and professional buildings	−19.92%	$25,356	$80,030	$33,019	$38,042	$31,665	$64,984
Stores and other mercantile buildings	26.72%	$43,128	$38,029	$41,720	$31,538	$34,035	$25,516
Other	15.43%	$4,040	$3,276	$5,600	$7,953	$3,507	$5,540
Consumer price index (December 1977 = 100)							
North Central US[c]	1.09%	—	176.2	—	176.1	—	174.3
North Central/population more than 1,250,000[c]	1.35%	—	180.7	—	180.3	—	178.3
North Central/population 385,000 to 1,250,000[c]	0.58%	—	172.5	—	174.1	—	171.5
North Central/population 75,000 to 385,000[c]	1.24%	—	171.2	—	170.7	—	169.1
North Central/population less than 75,000[c]	0.41%	—	171.4	—	171.3	—	170.7
Chicago (1967 = 100)	2.33%	333.9	331.4	331.1	330.4	326.3	325.9
St. Louis (1967 = 100)	1.27%	325.7	—	325.6	—	321.6	—
		1986:II	1986:I	1985:IV	1985:III	1985:II	1985:I
Personal income (in millions)[d,e,f]	5.38%	$178,690	$173,996	$173,178	$170,458	$169,561	$166,799
Per capita personal income[d,e,f]	4.76%	$15,433	$15,050	$15,001	$14,788	$14,732	$14,502

[a]The Conference Board, *Help Wanted Advertising*, September 1986. [b]Latest month projected by BEBR. [c]Percent change between August 1985 and August 1986. [d]Percent change between 1985:II and 1986:II. [e]Recent month is preliminary figure. [f]Seasonally adjusted at annual rates. [g]Percentage of companies receiving slower deliveries. [h]Represents absolute change (percent change not relevant).
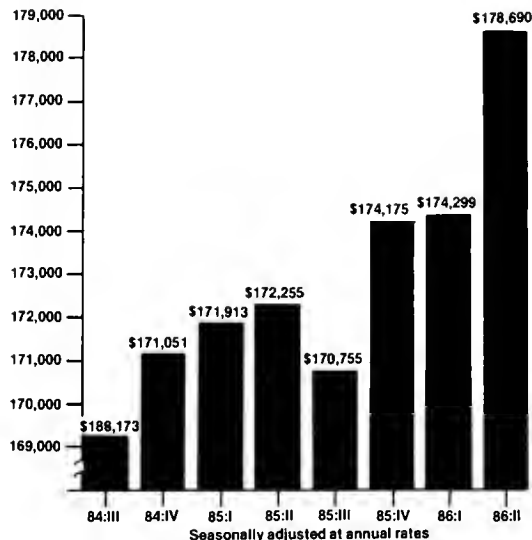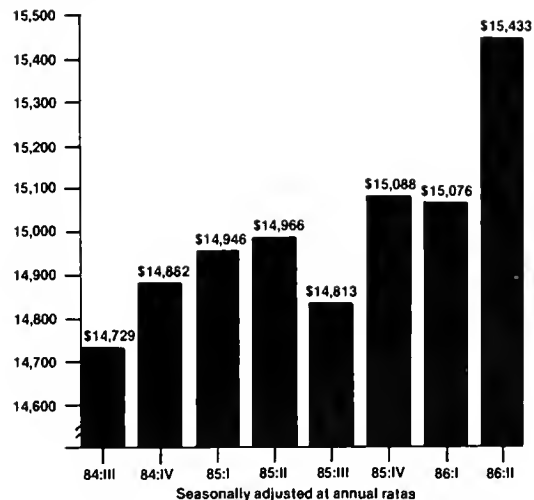
Composite Leading Indicators

ma(3) ——— ma(6) - - - - -

Retail Sales
(millions of 1986 dollars)

Oct 85	Nov 85	Dec 85	Jan 86	Feb 86	March 86	April 86	May 86	June 86	July 86	Aug 86	Sept 86
$5,547	$5,616	$6,470	$4,667	$4,455	$5,290	$5,455	$5,891	$5,583	$5,575	$5,689	$5,135

Personal Income
(1986 dollars)

Seasonally adjusted at annual rates

84:III	84:IV	85:I	85:II	85:III	85:IV	86:I	86:II
$188,173	$171,051	$171,913	$172,255	$170,755	$174,175	$174,299	$178,690

Per Capita Personal Income
(1986 dollars)

Seasonally adjusted at annual rates

84:III	84:IV	85:I	85:II	85:III	85:IV	86:I	86:II
$14,729	$14,882	$14,946	$14,966	$14,813	$15,088	$15,076	$15,433

Employment–Manufacturing
(thousands)

Oct 85	Nov 85	Dec 85	Jan 86	Feb 86	March 86	April 86	May 86	June 86	July 86	Aug 86	Sept 86
948.3	944.6	971.1	962.8	964.9	966.0	964.4	959.1	961.3	959.9	960.1	962.7

Average Weekly Earnings–Manufacturing
(1986 dollars)

Oct 85	Nov 65	Dec 85	Jan 86	Feb 86	March 86	April 86	May 86	June 86	July 86	Aug 86	Sept 86
$444.67	$448.32	$453.75	$438.55	$432.36	$446.50	$444.59	$444.33	$436.65	$436.71	$438.46	$439.60

Illinois Business Review

Illinois Economic Outlook

Illinois Seasonally Adjusted Employment Forecasts (in thousands)

	86:II			History				Forecast			
	Forecast	Actual	Error	85:III	85:IV	86:I	86:II	86:III	86:IV	87:I	87:II
Total Private Employment	4062.7	4070.5	−0.2%	4084.8	4086.1	4070.8	4070.5	4109.8	4116.1	4119.7	4128.1
Mining	24.8	26.0	−4.7%	29.3	29.0	26.8	26.0	25.9	24.6	23.6	22.8
Construction	177.5	180.3	−1.6%	187.1	185.8	177.4	180.3	184.2	180.5	176.8	173.9
Manufacturing	964.5	959.1	0.6%	972.6	976.8	971.3	959.1	957.3	948.8	938.9	933.7
Durable manufacturing	589.1	586.2	0.5%	596.8	598.0	594.2	586.2	586.4	577.8	569.4	565.0
Primary metals	56.1	55.7	0.6%	56.2	57.0	56.3	55.7	55.7	54.6	53.7	53.1
Fabricated metals	111.9	112.7	−0.7%	114.7	114.7	113.4	112.7	113.6	111.5	109.8	108.9
Nonelectrical machinery	147.2	144.1	2.2%	143.9	147.1	147.4	144.1	142.5	139.2	135.1	133.7
Electrical machinery	123.2	122.6	0.5%	130.5	127.0	125.1	122.6	122.5	121.8	121.8	120.8
Miscellaneous durables	150.6	151.1	-0.4%	151.7	152.0	152.2	151.1	152.1	150.6	149.0	148.5
Nondurable manufacturing	375.4	372.8	0.7%	376.4	378.6	376.1	372.8	370.9	371.0	369.5	368.7
Food products	94.2	94.7	−0.5%	93.3	94.3	95.1	94.7	92.9	93.6	93.9	93.9
Printing and publishing	112.1	110.1	1.8%	110.6	111.0	110.4	110.1	109.7	109.0	107.5	106.8
Chemical	58.3	56.7	2.8%	58.5	57.8	57.5	56.7	56.8	57.4	58.1	58.7
Miscellaneous nondurables	110.9	111.2	−0.2%	113.9	114.3	113.5	111.2	111.7	111.0	110.0	109.3
Transportation and utilities	273.2	271.9	0.5%	276.6	276.1	275.5	271.9	274.4	272.5	270.6	269.0
Wholesale and retail trade	1163.7	1179.7	−1.4%	1170.3	1171.1	1170.1	1179.7	1194.1	1206.1	1215.6	1223.5
Finance	343.5	340.9	0.8%	339.8	341.0	340.5	340.9	343.3	347.4	351.7	355.6
Services	1115.5	1117.4	−0.2%	1109.1	1106.3	1109.2	1117.4	1130.6	1136.3	1142.6	1149.6

As can be seen in the accompanying graph, the first and second quarters of 1986 showed a slight dip in total private employment. (Total private employment is the sum of the main catagories in the table above. It does not include government or farm employment .) However, the Illinois Econometric Model forecasts a jump of 39,000 in private employment for the third quarter. This forecasted increase is confirmed by preliminary data. Furthermore, the model shows continued growth in total private employment through 1987:ll. This growth is sparked by healthy advances in the services and wholesale and retail trade sectors.

Looking at the error column of the table above we can see that the model performed well in forecasting 1986:ll employment figures. With the exception of a 4.7 percent underestimate in mining employment, the estimates were close to the mark.

Illinois Private Employment (in thousands)

Illinois
Business

Review

GREGORY S. CHAUDOIN

Are Credit Card Interest Rates too High?

Since high inflation began to moderate in 1981, the prime rate has fallen markedly. It has dropped from 21 percent in 1981 to about 8 percent in 1986. Even so, during this same period the average interest rate charged for such cards as Visa and MasterCard has actually increased from 17.8 percent in 1981 to about 18.6 percent in 1986. Elected officials and consumer groups have expressed concern that credit card issuers are making excess profits. Some state and federal legislators have even threatened to place ceilings on credit card rates.

This article discusses the credit card market and whether credit card interest rates are too high. Also, the two most supported forms of regulation geared towards lowering interest rates, interest rate ceilings and disclosure laws, will be presented.

The Credit Card Market

It is estimated that about 79 percent of US consumers own credit cards. The two most commonly held types of credit cards are retail store cards held by 68 percent and bank cards held by 57 percent of consumers. The retail store cards with the widest circulation are the Sears card with a 51 percent ownership rate among US consumers, and the J. C. Penney card with 35 percent consumer ownership. Visa (45 percent) and MasterCard (34 percent) are the two most commonly held bank cards. These statistics were estimated from a survey carried out for *MONEY Magazine* by Lieberman Research Inc.

The major bank credit cards are issued and administered by institutions such as banks, savings and loans, and credit unions that are regional agents for national credit card plans such as Visa and MasterCard. These institutions pay franchise fees to the national plans and, in return, can charge whatever interest rate they choose. However, these institutions must fully fund the retail loans and operating expenses associated with card use.

Bank credit cards differ from retail store cards in that each bank card issuer sets its own interest rates and service fees. Retail store card interest rates are set nationally, with certain local differences arising from states with usury laws. Also, retail cards usually do not charge their users service fees. To make up for revenues lost by not charging service fees, retail card issuers usually charge interest rates two or three percentage points above the average rate charged for bank cards.

Even though more people own retail store cards than bank credit cards, bank credit cards are more widely accepted by all retailers, including Sears and J. C. Penney. Hence, bank card issuers have faced greater pressure to lower their card interest rates than retail card issuers.

The main bone of contention of the proponents of interest regulation is that the cost of funds for banks has diminished over the last five years, yet credit card interest rates have increased. The components of the cost of funds for a bank include such expenses as interest payments on savings deposits and certificates of deposit and interest payments on loans from other banks. These payments attract funds to card-issuing banks, and the banks, in turn, lend these funds out to credit card users at higher rates of interest.

In 1981, the average cost of funds for card-issuing banks with deposits over $200 million was 9.5 percent of each dollar transacted through a bank card, according to the Federal Reserve's *Functional Cost Analysis*. By 1985 the cost of funds had dropped to 7.3 percent. The cost-of-funds figure should be even lower in 1986, because of further reductions in the interest rates of certificates of deposit and interbank lending. So, since 1981 the cost of funds has steadily fallen along with the prime rate, mortgage rates, and yields on US Treasury securities.

Most banks and retail stores, however, are reluctant to lower interest rates. They contend that the cost of funds is relatively small compared to the expenses incurred by processing transactions, making monthly billings, evaluating credit applications, and costs associated with delinquent account and credit losses. Because of large administrative and processing costs, card issuers assert that it is wrong to assume that the total cost of credit card operations will fall with a decline in the cost of funds. Therefore, credit card interest rates are not to be expected to fall automatically with declining costs of funds.

The cost of funds also accounts for a much smaller proportion of the total costs of lending for credit card operations than for commercial lending and mortgage operations. From 1972 to 1984 the cost of funds of card-issuing banks averaged only 30 percent of the total expenses of credit card operations, as reported by the *Functional Cost Analysis*. By comparison, the cost of funds accounted for more than 75 percent of the total cost of commercial loans, and for nearly 90 percent of the total cost of mortgage lending. Studies have also found that funding costs for issuers of retail store cards are less important than administrative and overhead costs, said Federal Reserve official Emmet J. Rice.

Thus, credit card operations are unique in that they have proportionally greater administrative and processing costs than costs in obtaining funds. Therefore, if administrative and processing expenses increase by the same percentage that the cost of funds decreases, total costs of credit card operations will rise. For commercial lending and mortgage operations, however, total costs will fall. The example presented illustrates why the total cost of credit card operations need not move with the cost of funds.

Are Credit Card Rates too High?

The best way to judge whether credit card interest rates are too high is not to look at falling prime or mortgage rates, but to look at profits from credit card operations. The accompanying chart presents the average net earnings after the cost of funds of large card-issuing banks from 1974 to 1985. These net

earning figures represent the average pre-tax profit rates from bank credit card operations and were compiled from editions of the *Functional Cost Analysis* from the last 12 years.

Net Earnings after the Cost of Funds (percentage)

year
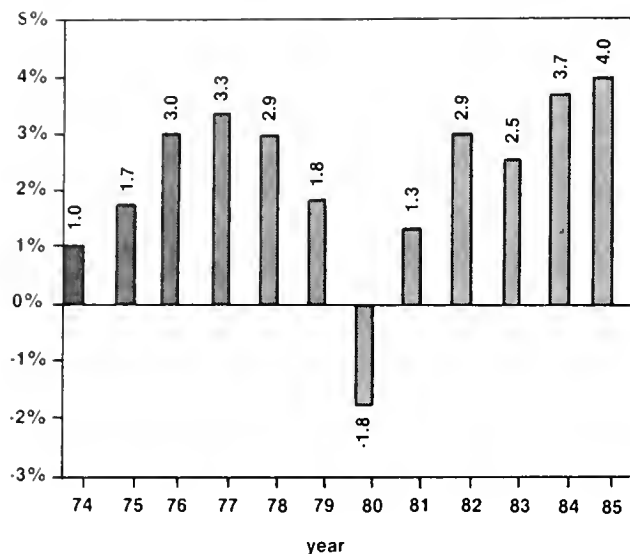
The chart shows that profit rates from credit card operations (net earnings after the cost of funds) had increased from 1.3 percent in 1981 to 4.0 percent in 1985. In addition, the 1984 and 1985 net earning rates are the highest figures over the 12-year span. Furthermore, the credit card industry in 1986 showed a 30 percent increase in pre-tax profits over 1985, said H. Spencer Nilson, publisher of the *Nilson Report*. These findings lend credence to the beliefs of the consumer advocates who feel that credit card rates have room to fall, and indeed should fall, while enabling card issuers to maintain normal returns.

One factor that enables card issuers to maintain high interest rates and earn high profits is that many card owners have been somewhat insensitive to the high rates. About 30 percent of card users do not really worry about interest rate charges because they consistently pay their credit card bill within the grace period, which is usually about 25 days. Full payment within the grace period is rewarded by no interest charges. For these prompt bill payers, credit card interest rates of 21 percent are little cause for concern.

Lack of consumer awareness is another cause of card-owner insensitivity towards high credit card rates. Fully one-third to one-half of the owners of Visa, MasterCard, and retail store cards are not aware that interest will be charged if bills are not paid in full. Only 63 percent of Visa owners, 64 percent of MasterCard owners, and 50 percent of retail store card owners surveyed are aware of the correct rate of interest charged on unpaid outstanding balances on their cards, according to the Lieberman Research survey for *MONEY Magazine*.

Many other bank card holders are not aware that each issuing bank sets its own interest rate and service fees and that by shopping around lower financing charges can be found. Arkansas and Connecticut, for example, are two states with interest rate ceilings where rates can found between 11 and 15 percent. In Illinois, the First National Bank of Lincolnshire offers rates of 15 to 18 percent to its depositors, depending on the size of deposit in the bank.

The more uninformed that card holders are about lower interest rate cards from other card issuers, the less sensitive they will be towards the high interest rates on their present cards. Thus, uninformed consumers enable many card issuers to keep their credit card interest rates up without losing many of their customers to competitors with lower rates.

Some consumer advocates and legislators contend that card issuers have too strong an advantage over uninformed card owners and propose that government should intervene on behalf of the consumers. One plan with wide support is to put a ceiling on the maximum rate that can be charged by card issuers. An alternative plan is a set of disclosure laws that promotes competition by increasing the awareness of consumers.

Credit Card Interest Rate Ceilings

Last year about ten bills were introduced in Congress that would affect credit card rates. Also, 22 states, including Illinois, had bills filed that would put a ceiling on card rates. Most of the interest rate ceiling plans call for a variable interest rate cap that would somehow be pegged to prime commercial lending rates or yields on US Treasury securities.

In Congress, a bill introduced by Senator Alfonse D'Almato (D-New York) would set national credit card interest rate limits to five percentage points above the average yield on six-month US Treasury bills outstanding the previous year. US Representative Frank Annunzio (D-Illinois) introduced a bill that ties maximum interest rates to eight points above the yield on one-year US Treasury securities. A plan from Senator Paula Hawkins (R-Florida) sets the ceiling at four percentage points over the rate the Internal Revenue Service charges on late tax payments (a compilation of prime interest rates from the previous six months, recomputed every six months). Based on current conditions, the national credit card interest ceilings would be between 12 and 15 percent.

Credit card ceilings would provide benefits for top credit risk consumers who have credit cards, but there are also economic costs associated with this regulation. One such cost is the inefficiency of credit rationing. When credit card interest rates are forced down by ceilings, revenue streams from card issuers diminish and profits fall, and even losses may occur. With lower profits, card issuers will be more selective in whom they accept as card holders. Hence, there will be a margin of consumers who desire credit cards—and would have credit cards at higher, unregulated rates—but will not be accepted for cards at ceiling rates.

Another drawback associated with variable interest rate ceiling plans is that they assume that changes in the prime rate and yields of US Treasury securities reflect changes in the cost of funds, which, in turn,

reflects changes in the total cost of credit card operations. If these assumptions are true, variable interest rate ceiling plans will limit interest rates and still enable card issuers to cover costs and make normal returns. But it has been shown that movements of the total cost of credit card operations are not strongly tied to movements of the cost of funds. So variable interest rate caps may not even allow card issuers a normal return on operations. For this reason, credit card issuers strongly oppose variable interest rate ceilings.

The drawbacks generally make federal elected officials wary of a national credit card interest rate ceiling. So a national rate ceiling does not appear likely. However, there is growing momentum for rate ceilings at the state level.

Here in Illinois, there is strong political pressure for lowering credit card rates. Illinois House Speaker Michael Madigan sponsored statewide public hearings on the issue last fall. State Sen. Vincent Demuzio has united with state Comptroller Roland Burris to push for a bill that would limit credit card rates to 7 percentage points above the quarterly average of three-year US Treasury notes. Perhaps the greatest pressure to lower rates comes from newly elected State Treasurer Jerry Cosentino.

Mr. Cosentino has announced that he is withdrawing state deposits from card-issuing banks that do not voluntarily lower their interest rates to 3 percentage points above the prime. Cosentino estimates that at any given time, $100 to $200 million is invested in the six or seven major banks that offer credit cards in the state. He started the withdrawal process 22 January 1987 when he withdrew about $220 million from Illinois' largest credit card issuer, the First National Bank of Chicago, which charges 19.8 percent credit card interest.

One reason why credit card ceilings are more likely to be supported at the state level than at the national level is that the economic cost to consumers is smaller. For example, if a rate ceiling in Illinois is placed at, say, 13 percent, the top credit risks will enjoy lower rates and consumers with marginal credit ratings may not be issued cards. However, the consumers who are denied credit cards in Illinois at 13 percent can still be accepted by card issuers in other states that have no ceilings. So consumers with high credit ratings are helped, and those with lower credit ratings are not hurt.

The credit card issuers in Illinois, on the other hand, would not fair so well. There is still the problem that variable interest rate caps do not accurately reflect the total cost of credit card operation. Over time this may be harmful to the credit card industry in the state. So credit card interest rate ceilings should be used very cautiously even at the state level.

Disclosure Laws

Proponents of credit card rate regulation often argue that the market is not working because card issuers are taking advantage of an uninformed public. Therefore, a simpler alternative to lower credit card interest rates than interest rate ceilings is to increase the information available to the public. Informing the public could be done through what are called disclosure laws.

Disclosure laws would require credit card issuers to prominently display annual finance charges for card use on all applications, print advertisement, and television ads and that they be announced in radio ads. Applications would also be required to list the grace period, annual fee, and all other fees that can be charged.

Both federal and state support are gaining momentum for bills that would enact disclosure laws. In the US Senate, three bills came up for hearings. In Illinois, state Representative Ellis Levin introduced a disclosure bill in the state legislature last fall. Also, many of the bills that sought interest rate ceilings contained disclosure provisions.

Disclosure laws will increase consumers' awareness level about their credit cards and the cards from competing issuers. Higher awareness will give card owners greater opportunities to shop around for better rates, which, in turn, will cause card issuers to become more competitive in their finance charges. The final result will be lower credit card rates. Thus, disclosure laws are designed with the goal of lowering credit card rates by making the market work more efficiently.

The advantage of disclosure laws over interest rate ceilings is that card issuers, not government, set their interest rates. Even though rates will fall due to greater competitive pressures, card issuers will at least have the opportunity to set rates where normal profits can be made. So, if policymakers feel that credit card interest rates need to be regulated, disclosure laws may be the best answer.

Conclusion

The high profits from credit card operations over the last three years are evidence that credit card interest rates are overdue for a fall and that, perhaps, the market is not working efficiently in the credit card industry. However, there are signs that rates may fall without government intervention.

In Illinois, the First National Bank of Lincolnshire has dropped rates to as low as 15 percent. Elsewhere, the AFL-CIO has made an agreement with the Bank of New York for a credit card with rates as low as 14.5 percent. Bank One in Columbus, Ohio offers a lower rate Visa card to contributors to PTL evangelist Jim Bakker. And Manufacturers Hanover of New York has added more than a million new accounts since it cut its rates to 17.8 percent from 19.8 in October of 1985. Chase Manhattan, the third largest bank card issuer, followed suit and lowered its rate to 17.5 percent.

Rates are falling across the nation as consumers are reading more information about interest rate differences at some competing card issuers. If these lower interest rate cards show profits for the card issuers, competitive pressures from the market should drive rates down without the aid of disclosure laws. However, if the unregulated credit card market fails to lower interest rates, there are elected officials in Illinois and other states who have the power and will to force them down. So, one way or another, expect credit card interest rates to fall in Illinois.

Recent Trends in Foreign Direct Investment in Illinois

Isuzu of Japan, in cooperation with Fuji Heavy Industries, will begin building trucks and utility vehicles in the United States in 1989. Currently, a joint Isuzu-Fuji committee is investigating possible plant sites in Illinois, Indiana, Ohio, Kentucky, and Tennessee. The $450 million plant initially will produce 120,000 vehicles annually with a future capacity to build twice that number. Already in existence and awaiting production for the 1987 model year is Diamond-Star Motors located in Bloomington, Illinois with a plant valued at $500 million. This plant has a capacity of 180,000 vehicles and will employ around 2,500 workers.

Why do foreign firms decide to produce in the United States? What have been the recent trends in foreign direct investment (FDI)? Finally, does the presence of these foreign-owned firms create a cause for concern?

What is FDI?

Foreign direct investment occurs when a foreigner acquires interest of 10 percent or more in a US based firm. This enterprise is called a US affiliate of the foreign company. Ownership (or control) of less than 10 percent is defined as indirect or portfolio investment. The distinction between direct and portfolio centers on the issue of control. The most obvious example of FDI occurs when a firm sets up a wholly owned subsidiary abroad, but FDI may also involve a joint venture agreement when the foreign-based firm has an ownership share of more than 10 percent. While a foreign firm with extensive portfolio interests may have much greater investment commitments in the United States than a firm controlling several US affiliates, only the latter represents FDI.

Table 1. Foreign Direct Investment in the United States, 1914–1984 (billions of dollars)

Year	Position*	Direct Investment Rate of Growth (%) (in constant $)	Position/GNP (%)
1914	1 3		3 4
1919	0.9	– 3 1	1 1
1934	1 5	4 1	2.1
1941	2.3	5.4	1 8
1950	3.4	2.7	1 2
1955	5.1	7.3	1.3
1960	6 9	5.5	1.3
1965	8 8	4 6	1 2
1970	13.3	7 0	1.3
1973	18 3	8 9	1.5
1980	83 0	10.2	3 0
1984	159.6	13.0	4.3

* Position is defined as the book value of the foreign direct investors' equity in and net outstanding loans to their US affiliates.

Source: David McClain, "Foreign Direct Investment in the United States," in *The Multinational Corporation in the 1980s* (Cambridge, MA The MIT Press, 1983), pp 280–82, and *Survey of Current Business*, various issues

Table 2. Foreign Direct Investment Position in the United States, by Industry, 1984

Industry of US Affiliate	Position, Year-end 1984 ($billions)	% Growth 1980–84 ($constant)
Manufacturing	$ 50.7	8.5
Food Products	8.1	10.1
Chemicals	16.7	9.3
Metals	5.7	9.2
Machinery	8.9	4.8
Other	11.1	8.8
Petroleum	24.9	14.1
Trade	30.5	13.8
Financial including insurance	23 2	13.0
Real estate	16.9	19.9
Other	9.3	14.4
All industries	$159.6	13.0

Source: *Survey of Current Business* (August 1985), p. 52.

Table 3. Gross Book Value and Employment of US Affiliates, by Region and Selected States

	Gross Book Value 1983 (billions)	Employment 1983 (thousands)	Percent of Region Employment
New England	$ 7.32	159.9	2.53
Mideast	31.96	566.0	2.87
Great Lakes	26.00	462.5	2.57
Illinois	6.97	125.8	2.45
Indiana	1.97	47.3	1.98
Missouri	2.44	37.2	1.57
Wisconsin	2.77	63.8	2.85
Four State Total	14.15	274.0	2.26
Plains	8.36	81.6	1.34
Southeast	58.62	615.1	2.54
Southwest	39 90	255.6	2.40
West	55.68	379.0	1.94
US Total	$241.60	2526.2	2.36

Source: *Survey of Current Business* (November 1985), pp. 38 and 48.

What are the Recent Trends in FDI?

Since early economic development in the United States was fueled by foreign investment, FDI is not a new phenomenon. As seen in Table 1, FDI since 1980 has exceeded 3 percent of gross national product, which is approximately the same as it was in 1914. Foreign investors contributed to the development in a number of important sectors (as recently as 1914, one-quarter of US Steel corporation was held by foreigners), and less than 75 years ago, FDI in the United States was twice the size of American investments abroad.

During the post-World War II period, US investment activity abroad grew rapidly so that by 1979 it was four times the foreign activity in the US ($192 billion versus $52 billion), but by the end of 1984, this ratio had declined to less than 2 to 1 ($233 billion versus $160 billion). These dollar amounts reflect the direct

Table 4. Employment of Nonbank US Affiliates, State by Country, 1983 (thousands of employees)

	Canada	France	Japan	Netherlands	Switzerland	U.K	W Germany	Total all Countries
Illinois	20.3	5.8	8.4	9.4	12.4	36.5	16.2	125 8
Indiana	9.2	2.4	1.5	9.5	2.5	8.2	9.5	47.3
Missouri	10.7	0.9	1.2	1 9	2.9	6.2	6 7	37 2
Wisconsin	12.7	13.0	2.8	5.4	3 8	16.2	5 4	63.8
Regional Total	52.8	22.3	13.9	26.2	21.6	64 1	37.8	274 0
US Total	456.1	197.3	162.3	228.3	174.9	560.3	350 5	2526 2

Source: *Survey of Current Business* (November 1985), p. 50.

Table 5. The Great Lake's Attractiveness to Foreign Investment, 1980–1982

Industry	Great Lake s Region
Food and kindred products	1.22
Chemicals and allied products	0.95
Petroleum and coal products	0.00
Rubber and plastic products	0.60
Stone, clay, and glass products	0.80
Primary metal industries	1.10
Fabricated metal products	1.89
Machinery, except electrical	1.27
Electric and electronic equipment	0.44
Transportation equipment	2.14
Instruments and related products	0.86

Source: Jane Sneddon Little, "Foreign Investors' Locational Choices," *New England Economic Review*, Volume 30 (January/February 1983).

investment "position," which is defined as the book value of the foreign direct investor's equity in and net outstanding loans to their respective affiliates. This "position" is not a measure of the total assets of the affiliates, which includes the equity held by and liabilities owed to investors and others. Over the last five years, the flow of FDI into the US has been over four times the flow of US investment abroad ($77 billion versus $18 billion).

Also during the 1980s the book value of foreign direct investor's equity in their US affiliates has increased at a 13 percent annual real rate (see Table 2). Over four-fifths of this investment is found in four areas: manufacturing (chemicals accounting for one-third), wholesale and retail trade, petroleum, and financial. Real estate holdings grew at the fastest rate, growing at a 70 percent higher rate than all other sectors.

FDI in Illinois and the Region

The geographical distribution of employment reveals (Chart 3) that five states (California, New York, Texas, New Jersey, and Illinois) contain 40 percent of all employment by US affiliates. Over 125 thousand workers, accounting for about 2.5 percent of Illinois' employment, were working for US affiliates in 1983. The four-state region (Illinois, Indiana, Missouri, and Wisconsin) had nearly 300,000, and the entire Great Lakes region nearly one-half million workers employed, over 2 percent of the region's total employment. In addition, US affiliates' book value of assets was $7 billion in Illinois alone, and over $14 billion in the four-state region.

Nationwide, most of the FDI is generated from seven countries: the United Kingdom, Canada, West Germany, The Netherlands, France, Switzerland, and Japan. These countries accounted for 85 percent of the total employment by nonbank US affiliates in 1983.

Illinois and the four-state region show a similar pattern (see Table 4).

Also similar are foreign-owned banks in the United States; by 1982, 175 foreign banks operated 441 offices with assets exceeding $250 billion. Over 60 percent of these assets were held by banks from three countries: Japan ($89 billion), The United Kingdom ($46 billion), Canada ($23 billion). The recent expansion in banking occurred as foreign banks followed customer relationships originally established in the home country, the US dollar's dominate role in international finance made a dollar-based operation advantageous in conducting international trade, and changes in the US regulatory environment helped attract foreign banks.

Table 5 shows the Great Lake's attractiveness to foreign investments in specific industries. The numbers shown are derived by dividing the region's share of investments in a given industry by the region's share of foreign investments. A number larger than one implies that the region has an above-average attractiveness for that particular industry. For example, the Great Lake's region is shown to be relatively attractive to foreign investment in transportation equipment, fabricated metals products, machinery (except electrical), food and kindred products, and the primary metal industries. By contrast, foreign investors have avoided petroleum and coal products, electric and electronic equipment, and rubber and plastic products.

Conclusion

Foreign direct investment remains a small part of the total volume of economic activity in the United States and in Illinois. As measured by assets and employment, there are selected sectors of the economy where the presence of foreign firms is of growing significance. The prospects for FDI suggest continued growth, albeit at a slower rate, over the remainder of the decade. The reasons for the attractiveness of the United States, and Illinois in particular, for foreign investment are economic and political stability, numerous and affluent consumers, a well-educated and well-trained work force, and an optimistic view of the future. The benefits of foreign investors to the economy are also important in jobs, tax revenues, and advanced technologies. In the final analysis, foreign investment represents a "two-way street" where both the foreign investor and the domestic (host) economy are winners.

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ANN B. SCHNARE

Chicago's Dubious Achievement

Over 20 years have past since Karl and Alma Taeuber, the noted sociologists at the University of Chicago, showed their city to be one of the most segregated housing markets in the country. Since that time, fair housing laws have been enacted at all levels of government, black income has risen relative to the incomes of whites, and the attitudes of blacks and whites alike have grown more favorable towards integration. In Chicago itself, communities like Oak Park have seen the birth of innovative programs designed to encourage racial mixing; and the Chicago Housing Authority, which controls almost six percent of the city's rental stock, has been brought to court for its racially discriminatory practices.

What difference, if any, have these developments made on the spatial concentration of the city's black population? While some segments of the black community have moved to racially integrated neighborhoods, the vast majority of Chicago's blacks are just as isolated from the white population as in the past. Recent analysis of national trends in segregation shows Chicago to be the most segregated metropolitan area in the country. Unlike preceding decades, which witnessed a steady increase in the spatial concentration of the city's blacks, the level of integration experienced by the average black remained relatively constant in the 1970s. However, this stability contrasts with more favorable trends observed elsewhere in the country, where the majority of blacks and whites experienced an increase in integration.

These conclusions are based on an analysis of census tract data for a large sample of metropolitan areas in 1960, 1970, and 1980. (Census tracts are relatively small geographic areas designed to reflect established neighborhood boundaries and containing an average of about 4,000 residents each.) A variety of indexes were used to measure the extent of segregation. The first two calculated each group's exposure to members of the other race. White exposure to blacks was defined to be the proportion black of the average white's neighborhood. Similarly, black exposure to whites was the proportion white of the average black's neighborhood.

While exposure rates proxy the level of integration experienced by the average household, they do not control for differences in the level of integration that is possible within a given metropolitan area. Thus, a third measure of segregation (the so-called exposure index) compared the exposure rates that occurred in a given market to the rates that would arise if each neighborhood had the same mix of blacks and whites.

This latter index was constructed to range from zero to 100, where zero depicts a market in which each neighborhood has an identical racial composition (perfect integration) and 100 depicts a market where neighborhoods are either all white or all black, but never mixed (complete segregation).

Table 1 compares trends in black and white exposure rates in the Chicago metropolitan area to trends observed nationwide. As is evident from the table, black exposure to whites decreased between 1960 and 1970, both in Chicago and in the majority of metropolitan areas throughout the country. A careful analysis of these data revealed that the decrease was caused by the peripheral growth of established minority areas. Since integration was more likely to occur at the boundaries of such areas, outward expansion of the ghetto induced a decline in the average black's exposure to whites. The explanation is geometric: the periphery of a circle or square grows less rapidly than its interior.

Between 1970 and 1980, however, this tendency towards the increased isolation of urban blacks was reversed in most parts of the country. Despite a continued growth in the size of their black populations, the overwhelming majority of metropolitan areas recorded a rise in the average black's exposure to whites. This development signaled a significant departure from previous patterns of peripheral growth. In contrast, black exposure to whites in the Chicago SMSA remained more or less the same throughout the decade. While the situation did not deteriorate, the city's black population did not experience the increases that were registered by minority populations in other areas.

Trends in the exposure rates of whites were more consistent over time and increased throughout the 20-year period, both in Chicago and nationwide. During the 1960s, when established racial patterns were

Table 1. Black and White Exposure Rates

	1960	1970	1980
Black Exposure to Whites			
Chicago	0.158	0.137	0.138
National Sample*	0.335	0.310	0.345
White Exposure to Blacks			
Chicago	0.027	0.030	0.037
National Sample*	0.043	0.049	0.067

*Statistics are based on a national sample of 64 SMSAs with three consecutive years of data.

Table 2. Distribution of Blacks by Percent Black in Tract

Percent Black in Tract	Chicago			National Sample*		
	1960	1970	1980	1960	1970	1980
< 1%	0.005	0.005	0.012	0.009	0.008	0.018
1–4%	0.009	0.013	0.014	0.025	0.028	0.033
5–19%	0.030	0.024	0.053	0.096	0.078	0.116
20–49%	0.066	0.058	0.078	0.168	0.164	0.210
50–89%	0.276	0.183	0.100	0.354	0.336	0.313
90 + %	0.615	0.717	0.746	0.348	0.386	0.310
TOTAL	1 000	1.000	1.000	1.000	1.000	1.000

*64 SMSAs.

Table 3. Segregation Patterns by Neighborhood Income

	Chicago			National Sample[*]		
	1960	1970	1980	1960	1970	1980
Black exposure to whites by neighborhood income						
Lower income	0.14	0.10	0.06	0.27	0.25	0.24
Middle income	0.35	0.29	0.20	0.64	0.52	0.47
Upper income	0.59	0.57	0.61	0.83	0.71	0.72
Distribution of blacks by neighborhood income						
Lower income	0.92	0.83	0.63	0.85	0.80	0.64
Middle income	0.06	0.14	0.30	0.11	0.15	0.27
Upper income	0.02	0.03	0.07	0.04	0.05	0.09
	1.00	1.00	1.00	1.00	1.00	1.00

[*] 64 SMSAs.

Table 4. Relative Index of Segregation

	1960	1970	1980
Chicago	0.814	0.832	0.807
National Sample[*]	0.561	0.592	0.532

[*] 64 SMSAs.

maintained, increases in the exposure rates of whites reflected the relatively high rate of growth of the black community, which caused border neighborhoods to grow at a rate that exceeded the growth of all white areas. In the 1970s, however, the increasing exposure rates of whites in the majority of metropolitan areas was to some extent the result of dispersion. As noted above, this was apparently not a contributing factor in Chicago, where established racial concentrations were, for the most part, maintained.

Perhaps the most striking feature of Table 1 relates to the differences that it reveals between exposure rates in Chicago and exposure rates in other metropolitan areas. Black exposure to whites in Chicago was less than half the national average in all three years. Furthermore, the relative position of the city's blacks clearly deteriorated over time. In 1960, black exposure to whites in Chicago was 47 percent of the national average; by 1980, this ratio had dropped to 40 percent. White exposure to blacks was likewise relatively low, and dropped from 63 percent of the national average in 1960 to 55 percent in 1980.

Table 2 presents additional information on the distribution of blacks across census tracts with varying racial compositions in 1960, 1970, and 1980. In Chicago, like the rest of the country, the proportion of blacks who lived in neighborhoods that were more than 50 percent black increased between 1960 and 1970. The increase was most pronounced in neighborhoods that were more than 90 percent black, which by 1970 contained about 72 percent of Chicago's black population. While the overall proportion of blacks in

neighborhoods that were between 50 and 90 percent black declined in the next ten years, the proportion in tracts that were more than 90 percent black continued to rise. This latter development stands in marked contrast to trends observed nationwide, where the proportion of blacks in neighborhoods that were more than 90 percent black declined from 39 to 31 percent. The figures in Table 2 again serve to emphasize the intensity of the segregation found in the Chicago metropolitan area. By 1980, three-quarters of the black population lived in census tracts that were more than 90 percent black. This concentration in ghetto areas was almost two and one-half times the national average. Although not illustrated by the table, the concentration of whites in predominately white neighborhoods was equally pronounced. In 1980, 75 percent of the area's whites lived in neighborhoods that were less than one percent black. The comparable national average was 57 percent.

Table 3 presents information on black exposure rates in lower-, middle-, and upper-income neighborhoods. The trends in Chicago are similar to those observed nationwide. Black exposure to whites declined in lower and middle income areas throughout the 20-year period; it also declined in upper-income neighborhoods during the 1960s, but then began to rise. The second half of the table presents information on the distribution of blacks across these different neighborhood types. Like the rest of the country, the black population in Chicago has shifted out of low-income census tracts, particularly in the 1970s. This shift from low income neighborhoods, where exposure rates were relatively low, into middle and upper income neighborhoods, where exposure rates were relatively high, has prevented a decline in the average black's exposure to whites in recent years.

Table 4 presents the so-called "exposure index," which compares the exposure rates of whites and blacks to the rates that could be achieved given the racial composition of the population. As is evident from the table, the level of segregation in Chicago increased between 1960 and 1970, and then declined. While these trends are similar to those observed nationwide, the recent decline in Chicago is not as pronounced as the one experienced by the average SMSA. Furthermore, an examination of the underlying data for individual SMSAs showed Chicago to be the most segregated market in all three years. Thus, the city's long-standing claim to the dubious distinction of "most segregated housing market" has, if anything, been strengthened in recent years.

Anne B. Schnare is Director of Housing Policy Research at the Urban Institute. This research was supported by a grant from the Office of Real Estate Research at the University of Illinois at Urbana-Champaign. Opinions expressed are the author's and do not necessarily represent the views of the Urban Institute or its sponsors.

ANNE E. WINKLER

Public Aid in Illinois: A Chance at Welfare Reform?

The State of Illinois' welfare system has been opened to important prospective change by the announcement of Project Chance on 12 December 1985, by Governor James Thompson and Gregory Coler, Director of the Illinois Department of Public Aid. Project Chance is an "employment initiative" designed to provide all welfare recipients access to training, education, work experience, and aid in job placement. Its goals are to place 112,500 welfare recipients in unsubsidized, full-time employment during 1986, 1987, and 1988 and to reduce public assistance expenditures by $40 million dollars per month.

The first section of this article examines the recent history of public assistance expenditures from 1976 through 1986. The second section focuses on Project Chance and its prospects for success.

Sources of Public Aid Expenditures in Illinois

In the state of Illinois, public aid comes in the form of medical and income assistance. In regard to income assistance, there are three major sources of expenditures: Aid for Dependent Children (AFDC); Aid to the Aged, Blind, and Disabled (AABD); and General Assistance (GA).

AFDC-basic payments are made to families with children needing public assistance due to the absence, incapacity, or death of one or both parents. AFDC-U payments are made to families with children needing public assistance due to the fact the main earner is unemployed. Funding for AFDC is shared jointly between the state and federal governments.

AABD payments are fully state-funded supplemental payments made to the low-income aged, blind, and disabled who meet eligibility requirements for the federally funded Supplemental Security Income Program.

General Assistance is a safety net for those in need who fail to qualify for these other programs. GA receives no federal funds. Instead, those local governments that levy a property tax are entitled to receive state aid. Other local governments fund General Assistance fully.

Medical Assistance (MA) is provided to AFDC and AABD recipients and to those who would otherwise qualify for these categories but earn too much, and yet still cannot pay their medical bills. Payments to these recipients are shared equally between the state and federal government. Medical assistance is also available to GA recipients and the medically indigent, those who are ineligible for GA as well as jointly funded assistance but cannot afford to pay their medical bills. These payments are fully funded by state revenues.

The amount of funds allocated to public assistance out of general fund revenues depends on several factors. First of all, the Department of Public Aid must compete with the demand of other agencies for general funds monies. As can be seen in Chart 1, public aid expenditures on operations and awards and grants as a percentage of total general funds expenditures decreased, though not steadily, from FY 76 to FY 86.

Public aid expenditures for a given fiscal year also depend on the fiscal condition of the Illinois economy and the state budget. During a downturn in the state's economy, the number of those on welfare rises, increasing the demand for transfer payments in the form of public assistance. At the same time, tax receipts decline. This causes the state budget to tighten, thereby reducing available funds. For example, from FY 82 through the first part of FY 84, the general funds monthly available balances were significantly below the warning zone of $200 million dollars. The general funds revenue crisis was reflected in limited growth of the AFDC and MA budgets for this period.

Distribution of Public Aid Expenditures

From 1976 to 1986, general funds expenditures on operations and awards and grants for public assistance increased 66.3 percent from $1.9 billion dollars to $3.16 billion dollars (see Chart 2). In terms of the relative growth of these expenditures, medical assistance expenditures nearly doubled, rising from $869 million to $1.723 billion. By comparison, AFDC expenditures increased only 20 percent, from $731 million to $877 million. GA expenditures increased 100 percent, $120 million to $239 million. Expenditures on AABD in 1976 were $40 million dollars. Subsequently, they decreased steadily to $29 million dollars in FY 83. They have since rebounded reaching $51 million dollars in FY 86. Charts 3 and 4 depict the shift in public aid spending towards medical assistance.

In real terms, these expenditures decreased from 1976 to 1986. Medical Assistance expenditures, deflated by Data Resources' Medical Services Price Index, fell 17.3 percent. AFDC expenditures, deflated by the Consumer Price Index, which includes all items for all urban consumers, fell 38.9 percent. Real GA expenditures fell during the late 1970s, but by FY 86 they had returned to their FY 1976 level.

A February 1986 report by the state comptroller explains the shift of public aid spending towards medical assistance and away from AFDC by pointing to the skyrocketing costs of medical services. Also, the reduced share of AFDC expenditures out of total spending reflect limits imposed on increases in AFDC payments.

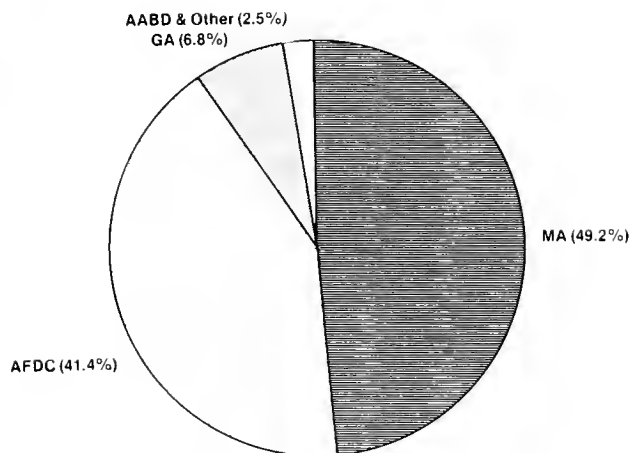**Chart 1. Illinois Public Aid Expenditures as a Percentage of Total Expenditure** *
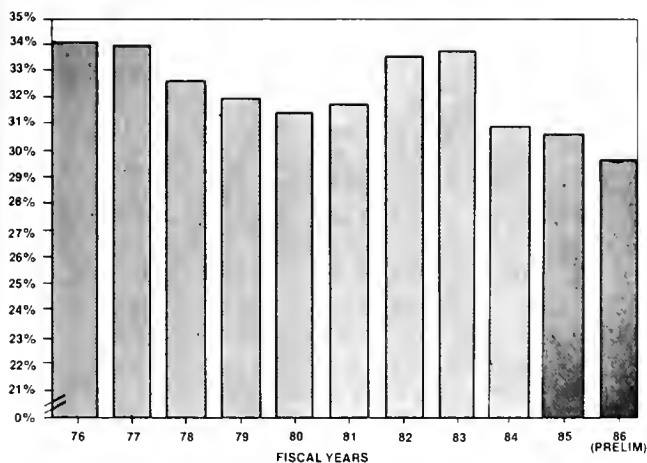
Chart 2. Illinois Public Aid Expenditures on Awards and Grants * **(in billions of dollars)**
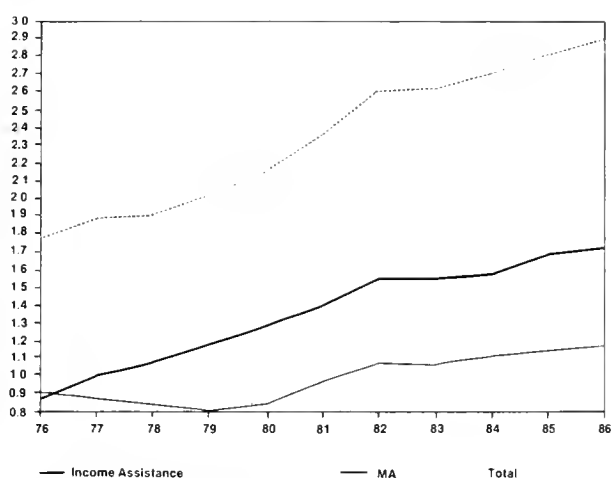
Income Assistance   MA   Total

Chart 3. Distribution of Illinois Public Aid Expenditures * **(FY 1976)**

AABD & Other (2.5%)
GA (6.8%)
MA (49.2%)
AFDC (41.4%)

Chart 4. Distribution of Illinois Public Aid Expenditures * **(FY 1986)**
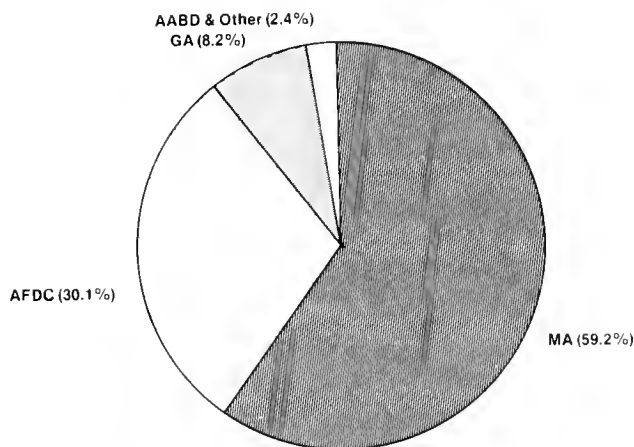
AABD & Other (2.4%)
GA (8.2%)
AFDC (30.1%)
MA (59.2%)

Since FY 76, the average number of people per month receiving public aid in the form of income assistance, at least partially funded by state revenues, has fluctuated between 772,000 and 923,000 but has shown no long-term trend (see Chart 5). From FY 76 to FY 86, the total number of AFDC recipients (those receiving basic and unemployment assistance) declined from 800,000 to 741,000. This can be explained by stricter eligibility requirements for AFDC recipients. There was a corresponding increase in the number of GA recipients, the safety net for those who do not otherwise qualify. From FY 76 to FY 84, the average monthly number of GA recipients increased from 69,000 to 146,000. The number has since declined to 133,000 recipients in FY 86.

Project Chance as a Long-Term Solution

In recent years, there has been increasing pressure on the Department of Public Aid to contain costs while attempting to provide adequate assistance to those in need. As a long-term solution, the Department of Public Aid has initiated Project Chance. The intent of Project Chance is two-fold. It is designed to help recipients become self-supporting, a socially beneficial goal, in and of itself. Secondly, it is designed to contain public aid spending.

As of 30 June 1985, of 342,002 adults receiving AFDC and Chicago General Assistance in Illinois, 63.6 percent had not completed their high school education. Of this total, 91 percent had completed a high school education or less. The intent of Project Chance is to improve

11

Chart 5. Recipients of Illinois Income Assistance (average monthly figures, in thousands)
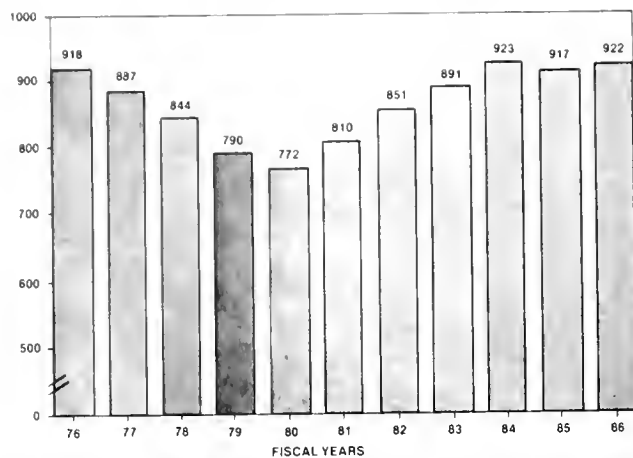
Source: Illinois Department of Public Aid

recipients' outside employment opportunities by providing training, education, work experience, and aid in job placement. Higher expected wages should encourage labor force participation. To the extent that workers enter or reenter the labor force and become self-supporting, the burden of welfare expenditures on the state budget will be lowered.

Structure of Project Chance

Although Project Chance was officially announced in December 1985, it was unofficially initiated at the start of FY 86. It combines features of the Massachusetts Employment and Training Choices Program (ET) and California's Greater Avenues of Independence (GAIN) Program. Like these programs, Project Chance offers welfare recipients training, education, work experience, and help in finding jobs.

Since January 1986, Project Chance has been administered by the Office for Employment and Social Services. All previously existing state employment programs, like Workfare under GA and WIN under AFDC, have been combined into a single employment program under Project Chance.

The basic premise of Project Chance is that all recipients are employable except those who are mentally or physically disabled. The program operates in two stages. The first stage assesses the skills and education of participants. The second stage provides training, education, work experience (similar to that provided under the earlier GA Workfare Program), and aid in job search. Provision of these services involves the coordination and interaction of public agencies including the Department of Public Aid, Department of Employment Security, Department of Commerce and Community Affairs, and the State Board of Education. Project Chance works with private firms as well. In FY 87, $4.5 million dollars will be awarded in contracts to private firms to pay for training programs tied to actual job openings.

Participation in Project Chance is mandatory for adults receiving Chicago GA and adult AFDC recipients with children over six, with the exception of those who are mentally or physically disabled. The program encourages exempt AFDC recipients, those with children under 6 to participate as "volunteers" by offering daycare and transportation. Those near the poverty line who do not currently receive welfare may also participate voluntarily.

As of 12 December 1985, the Department of Public Aid estimated total potential participation in Project Chance at 280,000. This estimate was computed based on the combined AFDC caseload of 239,516 and Chicago GA caseload of 102,486 on 30 June 1985. Of the potential 280,000 participants, 160,000 must participate. This figure is primarily comprised of GA recipients and a much smaller percentage of AFDC recipients. The remaining 120,000 estimated participants are volunteers. This figure is approximately equal to 50 percent of the AFDC caseload, which consists of individuals with children under six.

By the end of FY 86, approximately 105,000 welfare recipients had participated in Project Chance. This figure is comprised of 66,000 AFDC recipients, 35,000 GA recipients, and approximately 4,000 volunteers. Mandatory participation by AFDC and GA recipients combined was 59,000 below the Department of Public Aid's estimate. The 4,000 volunteers out of a potential 120,000 indicates limited participation by aid recipients with children under six. However, 4,000 is nearly 3,000 above the number of volunteers in employment and training programs in FY 85. Reasons why incentives for participation by this group may be limited are considered later.

Goals of Project Chance

The goal of Project Chance is to place 112,500 welfare recipients in full-time nonsubsidized employment over the course of 1986, 1987, and 1988. This figure is based on estimated placements of 35,000, 37,500, and 40,000 recipients, respectively, over the course of these three fiscal years. In FY 86, the Department of Public Aid exceeded its employment goal: 36,787 recipients obtained employment, an increase of 6,841 over FY 85 and 1,787 over the Department of Public Aid's estimate for FY 86.

From FY 85 to FY 86, the average monthly number of income recipients directly affected by Project Chance (AFDC and Chicago GA) fell overall by 4,000. This decrease was fully realized by a reduction in GA recipients. While this decrease may be attributed to the success of Project Chance, it might also be due to the relative state of the economy.

In regard to cost containment, the Department of Public Aid estimates the cost saving to be in the order of $40 million dollars per month. This figure is based on the estimated cost of maintaining 100,000 cases on welfare for one month. In FY 1986, $2.91 billion dollars in expenditures went to public aid awards and grants. Given this figure, their estimate suggests that Project Chance is expected to reduce expenditures on awards and grants by approximately 16 percent.

Prospects for Success

It seems plausible that the recipients most likely to obtain unsubsidized, full-time employment initially are those with relatively more past work experience, more training, and/or more education. However, given the fact that over 50 percent of welfare recipients lack a high school diploma, acquiring education and skills will take time. Consequently, their placement in unsubsidized employment cannot be expected in the very short term.

Even in the long term, optimism about the success of Project Chance must be guarded. A combination of education, training, and/or work experience may not necessarily lead to full-time, unsubsidized employment. During participation in Project Chance, the program provides daycare and transportation to allow recipients with young children to participate. In addition, these participants are eligible for state or jointly funded medical assistance. For those recipients who obtain full-time work that provides sufficient earnings to make them ineligible for continued state and/or federal aid, they currently lose the benefits of subsidized daycare, and, in many cases, medical assistance. Loss of these benefits may outweigh the gains of full-time employment and discourage full-time reentry into the labor market. This clearly represents the greatest disincentive to AFDC recipients with very young children.

At present, the Department of Public Aid is seeking to address this issue. To the extent that this problem is resolved by continuing medical assistance payments (to those who no longer qualify for state/federal aid or do not receive employer-provided medical benefits during their initial employment period) or by subsidizing daycare, the $40 million dollar estimated savings is an overestimate.

Finally, criticism has been levelled against Workfare, one of the programs of Project Chance. During a workfare assignment, recipients work for a public or not-for-profit employer. The number of hours a recipient can work per month is equal to their grant divided by the minimum wage. This number is significantly below 40 hours per week, every week. It has been argued that such programs may fail to provide public agencies, for whom recipients work, with incentives to train workers since recipients do not work for a particular agency every day for an extended period of time. Also, workers tend to turn over frequently in these positions. Moreover, job assignments tend to be for low skill positions that provide little training to increase the employability of recipients. The publication *Workfare in Illinois: A Review by the Legislative Advisory Committee on Public Aid* (March 1982) suggests that, at best, such programs improve the work habits of recipients.

Conclusions

In its *Annual Status Report* (1986), the Illinois Department of Public Aid points to the success of Project Chance in its first year. While the initial figures of those placed in unsubsidized full-time employment are promising and exceed the Department of Public Aid's goal, prospects for success must be carefully considered.

First of all, changes in expenditures, job placements, and public aid expenditures attributed to Project Chance must be isolated from business cycle effects. In a downturn, the welfare rolls will increase, and it is quite plausible that the negative cyclical effects on expenditure and employment figures may overshadow the positive impact of the employment initiative. Likewise, a reduction in welfare rolls actually due to an upturn in the economy may be erroneously pointed to as evidence of the program's success.

Secondly, while the initial results are promising, the program must address the issue that approximately 50 percent of the total AFDC caseload consists of a parent with children under six. Given this fact, *unsubsidized*, full-time employment may not be a realistic long-term goal. To address this issue, the Department of Public Aid must consider the cost of providing these recipients with a complete package of income and medical assistance versus the potential cost of subsidizing daycare and, in some cases, medical care of these recipients.

Illinois Business Indexes

The chart presenting the BEBR leading indicator series shows that the Illinois economy is expected to grow over the next two quarters. Both the three-month (MA 3) and six-month (MA 6) moving average indexes increase throughout most of 1986. Further, the three-month moving average remained above the six-month moving average during the past year with the exception of January and September. November 1986 showed a larger-than-average increase in the indexes—a further indication of future growth in the Illinois economy.

In addition, five other charts are presented. Vendor performance (representing the percentage of companies in Chicago receiving slower deliveries) has increased over 1986. Current levels of vendor performance are slightly higher than the average of 50 percent experienced in 1984 and 1985. The increase in vendor performance implies that the Illinois economy is improving: when business orders increase past some

point, firms begin to find it difficult to make timely deliveries. Help wanted advertising indexes for both Chicago and St. Louis have increased: another indication of an improvement in the Illinois economy. The Chicago index has increased fairly consistently over the year and compares favorably with the 1984–1985 average of 93. While the St. Louis index has not shown a consistent upward trend, it increased substantially in November and again compares favorably with the 1984–1985 average of 60. Coal production remained fairly constant over most of the past year, except for decreases of about 20 percent in July and November. Production of petroleum products fell substantially in 1986, approximately 25 percent for the year. The behavior of Illinois production in both markets is comparable to the sluggish markets nationwide, reflecting the glut in the energy market.

ILLINOIS BUSINESS INDEXES

	Percent Change Nov 1985-Nov 1986	Nov 1986	Oct 1986	Sept 1986	Aug 1986	Nov 1985	Oct 1985
Leading Indicator (MA3)	10.85[h]	10.71	7.98	7.53	6.61	−0.14	0.43
Leading Indicator (MA6)	8.60[h]	8.60	7.17	7.66	6.04	0.00	0.25
Employment-manufacturing (in thousands)[e]	1.60%	959.7	958.3	962.1	960.1	944.6	948.3
Average weekly hours-manufacturing[e]	−0.73%	41.0	41.0	41.2	40.9	41.3	40.8
Weekly earnings-manufacturing[e]	0.69%	$438.29	$437.47	$439.60	$435.18	$435.30	$429.62
Help wanted advertising-Chicago (1969 = 100)[a]	5.83%	109	105	101	100	103	96
Help wanted advertising-St. Louis (1969 = 100)[a]	9.23%	71	63	62	64	65	64
Retail Sales (in millions)[b]	−1.91%	$5,351	$5,774	$5,584	$5,576	$5,455	$5,359
Coal production (in thousands of tons)	0.07%	4,201	5,440	5,254	5,225	4,198	5,714
Petroleum products (in thousands of barrels)[e]	−22.42%	1,990	2,158	2,158	2,017	2,565	2,719
Vendor performance[g]	33.33%	56.0%	54.0%	52.0%	51.0%	42.0%	46.0%
Building permits (in thousands)							
Residential housing units	51.54%	4.169	4.087	5.502	4.326	2.751	3.316
Value of Residential housing	80.36%	$283,167	$273,180	$359,088	$296,180	$157,000	$211,277
Value of nonresidential construction							
Industrial buildings	−56.10%	$13,277	$44,107	$46,663	$20,324	$30,241	$34,849
Office, banks, and professional buildings	−19.02%	$21,526	$48,283	$25,356	$80,030	$26,582	$74,525
Stores and other mercantile buildings	51.06%	$23,708	$28,208	$43,128	$38,029	$15,694	$35,041
Other	45.47%	$5,141	$4,593	$4,048	$3,276	$3,534	$4,502
Consumer price index (December 1977 = 100)							
North Central US[c]	0.91%	—	176.5	—	176.2	—	174.9
North Central/population more than 1,250,000[c]	1.18%	—	180.3	—	180.7	—	178.2
North Central/population 385,000 to 1,250,000[c]	0.35%	—	174.0	—	172.5	—	173.4
North Central/population 75,000 to 385,000[c]	1.29%	—	172.3	—	171.2	—	170.1
North Central/population less than 75,000[c]	0.06%	—	171.7	—	171.4	—	171.6
Chicago (1967 = 100)	1.39%	328.7	331.3	333.9	331.4	324.2	322.6
St. Louis (1967 = 100)	0.68%	323.8	—	325.7	—	321.6	—
		1986 II	1986 I	1985:IV	1985:III	1985:II	1985:I
Personal income (in millions)[d,e,f]	5.38%	$178,690	$173,996	$173,178	$170,458	$169,561	$166,799
Per capita personal income[d,e,f]	4.76%	$15,433	$15,050	$15,001	$14,788	$14,732	$14,502

[a]The Conference Board, *Help Wanted Advertising*, November 1986, [b]Latest month projected by BEBR, [c]Percent change between October 1985 and October 1986, [d]Percent change between 1985 II and 1986 II, [e]Recent month is preliminary figure; [f]Seasonally adjusted at annual rates, [g]Percentage of companies receiving slower deliveries, [h]Represents absolute change (percent change not relevant)

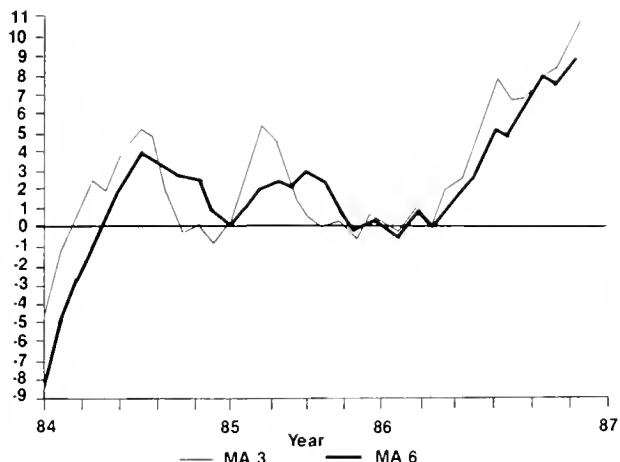## Chart 1. Composite Leading Indicators (Average Percent Change in Base Indexes)

11
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9

84   85   86   87
Year
—— MA 3   —— MA 6

Chart 2. Vendor Performance (percentage of companies receiving slower deliveries)

56%

50%

0%

| Dec | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov |
| 85 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 |

46% 46% 48% 50% 50% 55% 50% 54% 51% 52% 54% 56%

Chart 3. Help Wanted Advertising—Chicago (1969 = 100)

110

100

90

0

| Dec | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov |
| 85 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 |

104 91 93 94 94 86 101 103 100 101 105 109

Source: The Conference Board, *Help Wanted Advertising*

Chart 4. Help Wanted Advertising—St. Louis (1969 = 100)

71
70

65

60

0

| Dec | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov |
| 85 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 |

67 69 70 70 65 65 70 65 64 62 63 71

Source: The Conference Board, *Help Wanted Advertising*

Chart 5. Coal Production (thousands of tons)

6,000

5,500

5,000

4,500

4,000

0

| Dec | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov |
| 85 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 |

4,632 5,813 5,309 5,485 5,866 5,456 5,325 4,355 5,225 5,254 5,440 4,201

Chart 6. Petroleum Products (thousands of barrels)

2,750

2,500

2,250

2,000

0

| Dec | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov |
| 85 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 | 86 |

2,533 2,664 2,650 2,502 2,376 2,267 2,175 2,350 2,017 2,158 2,158 1,990

Illinois Business Review

Illinois Economic Outlook

Illinois Current Economic Indicators

	History					Forecast			
	85:4	86:1	86:2	86:3	86:4	87:1	87:2	87:3	87:4
Personal income (in thousands)									
Total personal income	$173,178	$173,996	$178,690	$183,022	$186,682	$189,595	$193,077	$196,957	$200,732
Manufacturing	28,882	28,484	28,435	28,743	28,852	28,735	28,903	29,244	29,496
Services	29,155	29,853	30,346	31,381	32,134	32,863	33,662	34,521	35,429
Wholesale and retail trade	21,748	21,927	22,099	22,654	23,182	23,650	24,100	24,550	24,992
Finance, insurance, and real estate	10,812	11,186	11,640	11,728	11,676	11,806	11,965	12,153	12,356
Employment (in thousands)									
Private nonfarm employment	4,085	4,070	4,070	4,109	4,114	4,108	4,113	4,124	4,133
Manufacturing	977	968	959	957	946	929	922	920	915
Services	1,107	1,110	1,117	1,130	1,136	1,142	1,149	1,157	1,164
Wholesale and retail trade	1,171	1,171	1,180	1,194	1,206	1,215	1,222	1,229	1,234
Finance, insurance and real estate	341	340	341	343	347	351	354	357	360

Source: Bureau of Economic and Business Research

Illinois experienced strong economic growth in the third quarter of 1986. The Illinois Econometric Model predicts that economic growth will continue to be strong through 1987, with the exception of a slight dip in the first quarter. The chart shows past and forecasted growth rates of personal income and employment levels, which act as current indicators of the health of the state's economy.

From the table, it can be shown that the state economy is faring quite well despite a continuing decline in the economic performance of the manufacturing sector. Traditionally, this sector has been the backbone of Illinois' economy. In recent years, however, the services, wholesale and retail trade, and financial sectors have provided the greatest impetus towards economic growth. The outlook for Illinois is that these sectors will continue to spark economic recovery.

Illinois Personal Income and Employment (annualized growth rates)

Source: Bureau of Economic and Business Research

Illinois
Business

Review

Illinois Statistical Abstract

The *Illinois Statistical Abstract* provides over 650
pages of statistics on Personal Income; Transfer
Payments; Farm Income; State Taxes; Banking and
Prices; Manufacturing (with information on large and
small establishments, employers, payroll, production
employees, hours and wages for production employees,
value added by manufacturer, cost of materials, value
of shipments, and new capital expenditures); Service
Industries; Building Permits; Employment; Employ-
ment, Hours, and Earnings; Labor Force Statistics; and
Population. These data will be useful to scholars and
students, newspapers, state and local government
agencies, businessmen, lawyers, accounting firms,
management firms—in short any one seeking market
or location information. The book will be available in
paperback ($25), and users with heavier analysis needs
will be able to purchase the book on diskette ($40).

Also available is the *1987 Illinois Economic Outlook*.
For further information about these publications,
contact the Bureau of Economic and Business Research,
University of Illinois at Urbana-Champaign, 428
Commerce West, 1206 South Sixth Street, Champaign,
IL 61820 (217-333-2330).

ROBERT RESEK, FRED GIERTZ, DAVID LEE,
AND PETER DONHOWE

Exploiting Federal Tax Laws: A Proposal For Illinois Revenue Enhancement

On 4 March 1987 Illinois Governor James Thompson
unveiled a variety of proposals to increase state tax
revenues. To finance the $22.1 billion budget he
presented to the General Assembly, he called for
additional revenues from four major sources: a higher
personal income tax rate, a sales tax broadened to
include some services, an increased gasoline tax, and
an increase in the automobile license plate fee.
Offsetting these increases would be a one-half percent
reduction in the sales tax rate and an increase in the
personal exemption, which is the amount an individual
can exclude per dependent before paying state income
tax.

The Governor's view—one that is shared by many
others—is that state expenditures must expand if
Illinois is to achieve a variety of goals he and many in
the legislature hope to accomplish. Table 1 gives the
Governor's estimates of revenue gains and losses from
his proposals. In all, he projects a gain of $1.056 billion
in the fiscal year ending June 1988 and $1.596 billion
in fiscal year 1989.

It is not our purpose to argue the relative merits and
pitfalls of raising new revenues for the state
government. We are willing to believe that the case has
been made for a tax increase. Rather, this article
presents an analysis of the implications of the
Governor's proposal and offers alternatives that might
be considered because they take greater advantage of
the recent changes in federal tax laws.

Federal Tax Changes

Prior to 1987, Illinois residents who itemized
deductions on their federal returns could subtract state
and local income, sales, and property taxes from their
taxable income. The saving to each taxpayer depended
on the taxpayer's marginal tax rate. For example, if a
person with a marginal tax rate of 40 percent paid
$2,000 in state and local taxes, the deduction lowered
his or her federal tax bill by $800. For all Illinois
taxpayers together, the savings were considerable,
amounting to several billion dollars each year.

Under the new federal law, state and local income
and property taxes remain deductible, but sales taxes
are not. Even though federal tax rates have been
lowered, making all deductions less valuable, the loss
of the sales tax deduction will still be felt by many of
the state's taxpayers.

In addition, state personal income tax collections are
expected to increase as a result of changes in federal
law. This is because the new federal tax law eliminates
a number of tax preferences or "loopholes," making a
greater share of individual income subject to the

federal—and state—tax (because Illinois essentially follows federal procedures on such matters). While federal tax rates have been reduced, the Illinois rate has not. Assuming the rate remains the same, the increased revenue to the state may be as much as $100 million, according to the Illinois Economic and Fiscal Commission.

However, given the new federal law, it would also be possible for the state to increase its revenues without significantly increasing the combined federal-state burden on Illinois taxpayers. Specifically, the state could reduce the nondeductible sales tax and make up for the lost revenue by increasing its still deductible income tax.

A shift from the sales to the income tax would also make the state's tax system more progressive; that is, the tax burden would be lessened for those with low to moderate incomes and increased for those with higher earnings. This is because the proportion of family income that goes to pay for sales taxes is usually higher for low-income individuals and families than for those with high incomes.

The following analysis details the effects of these changes on state revenues and individual taxpayers

Table 1. Thompson's Tax Proposals

Proposed Change	Revenue (millions of dollars)	
	FY 1988	FY 1989
Raise personal income tax rate from 2.5% to 3.0%	$ 563	$ 642
Extend sales tax to a broad range of services	233	740
Extend sales tax to include computer software	8	8
Extend sales tax to include nonprescription drugs	27	28
Increase gasoline tax from 13 to 22 cents per gallon over five years	189	315
Increase license plate fee from $48 to $65 per year	79	173
Raise the personal exemption to $1,250 in 1988, $1,500 in 1989	−43	−129
Lower the sales tax rate from 5% to 4.5% in 1989		−182
TOTAL	$1,056	$1,595

with different incomes. Four alternative tax proposals are examined. First, we look at what would happen if the sales tax were eliminated and replaced by a higher income tax. Second, we examine a more balanced approach, one that envisions a one percentage decrease in the sales tax rate matched by a one percent increase in the income tax rate for individuals. Third, we examine the Governor's proposal for income taxes. Finally, we consider the effect of the Governor's proposal for income and sales taxes. It should be noted

that our estimates assume the various tax plans were fully effective from the beginning for the tax year. Actual collections may be somewhat less, depending on how the new programs are implemented.

Eliminate Sales Tax and Replace it with Income Tax

Modifying state taxes by eliminating the sales tax and replacing the lost revenue with higher income taxes offers the greatest possible benefit for the state's taxpayers, because it would eliminate a nondeductible tax and increase a deductible tax. It would also yield the most revenue to the state. As can be seen from Table 2, if the sales tax were totally eliminated and the personal income tax rate raised from 2.5 percent to 5.93 percent, the net effect on the state's taxpayers would be zero, but state revenues would expand by about $895 million. However, as Table 3 demonstrates, families with taxable incomes of less than $50,000—the bulk of the state's residents—could expect their tax obligations to be lowered by amounts ranging from $112 to $178, while a typical family with higher taxable earnings would face a $775 net increase. This shift of tax burden away from taxpayers in the lower income groups reflects the shift away from the regressive sales tax toward the proportional income tax.

Decrease Sales Tax Rate 1% and Increase Income Tax Rate 1%

As can be seen from Table 2, raising the state personal income tax rate from 2.5 percent to 3.5 percent would bring in $1.285 billion in additional income tax revenue. But those who paid it would have an opportunity to claim a federal deduction, thereby lowering their federal tax bill by $261 million. By allowing a deduction for state income taxes, the federal government, in effect, would reduce the total tax liability of Illinois taxpayers from $1.285 billion to $1.024 billion. Cutting the 5 percent sales tax to 4 percent would save taxpayers another $700 million. Therefore, as Table 2 shows, the net cost to taxpayers would be only $322 million but the state would gain $583 million in new revenues.

Under this approach, as can be seen in Table 3, those with high incomes would face an increase of $372 a year, while those with low incomes would pay $14 a year less. The great majority of Illinois families would pay somewhat more in taxes—from $11 to $62 a year.

Increase Income Tax 0.5% and Raise the Personal Exemption to $1,500

Our analysis of the Governor's proposed increase in the personal exemption coupled with a 0.5% increase in the personal income tax rate shows that the state would receive an additional $465 million in income tax revenue. The federal subsidy from this proposal is estimated to be $112 million, which leaves Illinois taxpayers with an effective tax increase of only $353 million.

In addition, as can be seen in Table 3, the average Illinois family with an income of less than $10,000 will actually see a $51 decrease in their tax bill, primarily as a result of the increased exemption. Taxes for families in higher income groups are expected to increase from $18 to $313.

Table 2. Alternative Proposals

	Proposal			
	Eliminate Sales Tax with Offsetting Income Tax Increase	Lower Sales Tax By 1% and Raise Income Tax by 1%	Raise Income Tax 0.5%, Personal Exemption $1,500	Raise Income Tax 0.5%, Personal Exemption $1,500, Sales 4.5%, Broaden Base
Income tax rate	5.93%	3.50%	3.00%	3.00%
Personal exemption	$1,000	$1,000	$1,500	$1,500
Additional income tax revenue*	$4,408	$1,285	$465	$465
less federal deduction*	($895)	($261)	($112)	($112)
Net increase to taxpayers*	$3,513	$1,024	$353	$353
Sales tax rate	0.00%	4.00%	5.00%	4.50%
Net increase to taxpayers*	($3,513)	($703)	$00	$312
Total net increase to taxpayers*	$00	$322	$353	$665
Gain in state revenues*	$895	$583	$465	$777

*Millions of dollars

Table 3. Net Change in Family Tax Liability by Income Group

	Proposal			
Income Group	Eliminate Sales Tax with Offsetting Income Tax Increase	Lower Sales Tax By 1% and Raise Income Tax by 1%	Raise Income Tax 0.5%, Personal Exemption $1,500	Raise Income Tax 0.5%, Personal Exemption $1,500, Sales 4.5%, Broaden Base
Under $10,000	$ –129	$ –14	$ –51	$ –28
$10–20,000	–122	11	18	63
$20–40,000	–178	21	62	132
$40–50,000	–112	62	107	198
Over $50,000	775	372	313	455

Increase Income Tax 0.5%, Raise the Personal Exemption to $1,500, Lower the Sales Tax Rate to 4.5%, and Broaden the Sales Tax Base to Include Services

The Thompson proposal involves increasing the income tax rate by 0.5%, raising the personal exemption by $500, broadening the sales tax base, and lowering the sales tax rate by 0.5%. Our analysis indicates that these reforms will provide an additional $777 million dollars in state tax revenue (Table 2). This approach produces an estimated $312 million in additional sales tax revenues and $465 million in additional receipts from the personal income tax, $112 million of which is picked up by the federal deduction. Therefore, the effective tax increase would be only $665 million.

As Table 3 illustrates, families with the lowest incomes would have their annual tax burden reduced, typically, by $28, while others would have theirs increase from $63 to $455 a year.

Policy Implications

In deciding whether either of these approaches—or some other variation—would be sound public policy for Illinois, our elected officials are certain to consider a variety of factors.

For example, prudent tax policy requires a balanced source of revenues. Therefore, a complete move away from sales taxes might put too much dependence on the income and property taxes, which would then supply the bulk of the state's revenues. It would also mean that state revenues would be slower to catch up with inflation, should the nation experience another surge in the general price level.

It is also true that surveys indicate that the public tends to prefer the sales tax to the income tax—even though the sales tax tends to fall more heavily on low- and moderate-income residents, who make up the great majority of taxpayers.

In particular, people object to high levels of income tax. Although all of the plans discussed here would require a higher tax rate for Illinois, it is important to keep in mind that, as personal income taxes go, Illinois is a low-tax state. Illinois now ranks 35th from the top in the level of individual income taxes paid per $1,000 of personal income.

Moreover, even with higher state income tax *rates,* and a lower sales tax, the combined state and federal tax *burden* for the state's taxpayers need not change. In short, raising the state income tax rate and lowering its sales tax rate would not significantly alter the state's standing as a relatively low-tax state or otherwise seriously impair its competitive standing. Indeed, there may well be advantages to a lower sales tax rate—particularly for merchants in border areas—not to mention the real advantages that low- and moderate-income families would enjoy under an adjustment making the state's tax structure less regressive.

Summary

Illinois public officials are currently debating what might be done to raise new revenues to support necessary elements of state government. The new federal tax laws have eliminated the deductibility of state sales taxes, providing the state with an opportunity to make a beneficial adjustment in its tax system. By lowering or eliminating the sales tax and modestly raising its income tax, Illinois can capture a substantial federal subsidy. The windfall can be used either to lower the real tax burden of Illinois taxpayers or increase state tax revenues without increasing the burden to Illinois taxpayers. Our analysis indicates that the state could generate more than $500 million in additional money without significantly increasing the net burden of federal and Illinois taxes on most of the state's taxpayers. The change in the Illinois tax structure would also move the state toward a fully proportional tax system. It would lessen the tax burden for low- and moderate-income families, while increasing it for those with incomes above $50,000.

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REED OLSEN

Labor Force Developments in Illinois

Recent labor force disturbances in Illinois are short-term phenomena that are expected to lead to long-term growth. Illinois unemployment rates have been higher than those for the Unites States as a whole since early 1979. In earlier periods of national economic weakness, Illinois unemployment rates followed national trends but remained lower than those for the nation. Employment ratios for Illinois (the ratio of employment to population) have recently fallen below those for the United States, and Illinois has lost high-paying manufacturing jobs at a faster rate than has the country as a whole. Illinois manufacturing jobs have been replaced in part with traditionally lower-paying service jobs.

These labor force disturbances have been regarded as evidence of the relative weakness of the Illinois economy. But in light of the fact that the United States as a whole is experiencing a shift from a manufacturing economy to a service economy, it can be argued that current employment changes in Illinois are the means of assuring Illinois of a secure position in the future US economy.

This article presents labor force and employment data comparing Illinois with the United States and other states over a period of time. First, there is a discussion of the methods by which the statistics are developed; this discussion provides insights into the strengths and weaknesses of the alternative methods. Second, historical evidence is presented comparing labor force developments in Illinois and the United States. Finally, the view that recent labor force disturbances in Illinois will lead to a long-term improvement in the Illinois economy is discussed. Labor force data from other states are also presented supporting the view that the Illinois economy will improve in the long term.

Overview of Methods

Estimates of employment and unemployment in the US are developed according to three different methods. Industrial employment is estimated using information collected directly from firms.[1] Household survey data are used for the United States as a whole and for 13 states and regions, including Illinois.[2] Econometric and statistical techniques are used to estimate the labor statistics for the remaining states, local areas, and regions.[3]

Industrial employment for the US and Illinois is collected by the US Bureau of Labor Statistics. The information is collected as a supplement to each establishment's quarterly unemployment insurance reports. For an establishment making products in more than one industry, the entire employment is counted under the industry of the principal product. The chief strength of industrial employment statistics is that they include most establishments in the country. Those employed consist of workers on payrolls who received pay for any part of the month in question that includes the twelfth day of the month. The major weakness of industrial employment statistics is that they exclude proprietors, self-employed workers, unpaid volunteer/family workers, farm workers, and domestic workers.

As part of its continuing current population survey, the Bureau of the Census conducts a monthly household survey. For purposes of the survey, an individual is placed in one of three categories: employed; unemployed; or out of the labor force. A person is considered employed if he or she works as a paid employee for any time during the week in question. Also considered as employed are people who worked 15 hours or more as an unpaid employee for a family business or who were temporarily absent from jobs due to sickness, vacation, bad weather, and so on.

A respondent who is not employed is considered as unemployed if two conditions are met. First, it is necessary that the person be available for work except for temporary illness. Second, it is generally necessary for the person to have made some specific effort to find employment.

The labor force is defined as the sum of employment and unemployment. The unemployment rate is derived from these estimates. It is the ratio of unemployment to the labor force, and, thus, it has all the weaknesses of a ratio. It can get larger for several reasons: unemployment may rise; the labor force may fall; unemployment may rise more rapidly than the labor force; or the labor force may fall more rapidly than unemployment. Any given short-term change in the unemployment rate can reflect alternative underlying economic scenarios. Hence, short-term changes in the unemployment rate may provide a misleading indicator of the strength or weakness of the economy.

Beyond the ratio problem, there is a view that labor markets work in a way that can induce other problems of short-term interpretation. For example, from time to time unemployment may rise as employment opportunities improve. People who have been outside the labor force may be induced to enter it because plenty of jobs appear to be available. But if they do not find jobs immediately, the rate of growth in unemployment can be more rapid than the growth in employment. It can be argued that such an increase in the unemployment rate reflects strength in the underlying economy, not weakness.

Likewise, unemployment may fall as employment opportunities worsen. People who were in the labor force, but unemployed, may become discouraged by the lack of job opportunities and leave the labor force. If unemployment declines more rapidly than employment, the unemployment rate will fall. Even so, the decline reflects underlying weakness in the economy, not strength.

Employment ratios, defined here as the proportion of the population employed, are another measure of the economic situation. But employment ratios do not have the problems inherent to the unemployment rate. The two components of the employment ratio, population and employment, are substantially independent—at least in the short term. Thus, for example, a short-term rise in employment would not cause population to rise. The population of an area changes by virtue of changes in birth/death rates and through population shifts among geographic areas. Birth/death rates tend to be fairly stable over the short term. Thus, short-term changes in employment ratios tend to reflect employment changes.

Historical Evidence

Unemployment rates, employment ratios, and industrial employment statistics, as traditionally interpreted, suggest that the Illinois economy has weakened relative to the nation as a whole.

Charts 1 and 2 present US and Illinois unemployment rates and employment ratios, respectively. Notice that both series suggest that Illinois, during the 70s, was relatively better off than the nation as a whole. Illinois unemployment rates were lower than US unemployment rates until 1980. Employment ratios were larger in Illinois than in the United States until 1984.

Comparisons of recent Illinois and US unemployment rates suggest that the Illinois economy has begun to fare poorly relative to the country as a whole. Since 1980, Illinois unemployment rates have been 1.3 percent higher, on average, than US rates. While Illinois employment ratios fell below US ratios in 1984, the relative decline has been quite small.

Long-term changes in employment ratios for Illinois reflect, at least in part, the outflow of population from Illinois. From 1970 to 1985 population growth in the US was expanding at a 1.05 percent average annual rate. Such an increase implied stable birth/death rates. Moreover, because the US has stringent immigration laws, there has not been a large influx of people into the US from abroad. Illinois has had a much lower growth rate than the nation as a whole. The Illinois population has grown at a 0.24 percent average annual rate with some years showing population declines. Assuming Illinois birth/death rates similar to those in the country as a whole, population has been leaving Illinois.

There are two conflicting explanations for the loss of population in Illinois. First, lack of employment opportunities and low wages in a geographic area provide incentives for workers to move from that area. Moreover, it is the young and highly skilled workers that are more likely to move from a depressed region. Younger workers have more time to reap the benefits of moving than older workers. There is a view that the older, chronically unemployed workers remain, thereby weakening the economy further. According to

such considerations, employment ratios in Illinois would overstate the strength of the Illinois economy.

Another explanation of the outflow of population from Illinois is that workers' geographic preferences have changed. Sun states—such as Florida, Texas, Arizona, and California—have had large increases in population. From 1970 to 1980 the population of these four states increased at a 3.6 percent average annual rate, much higher than the US average during the same period.

Chart 1. Unemployment Rates (unemployment/labor force)
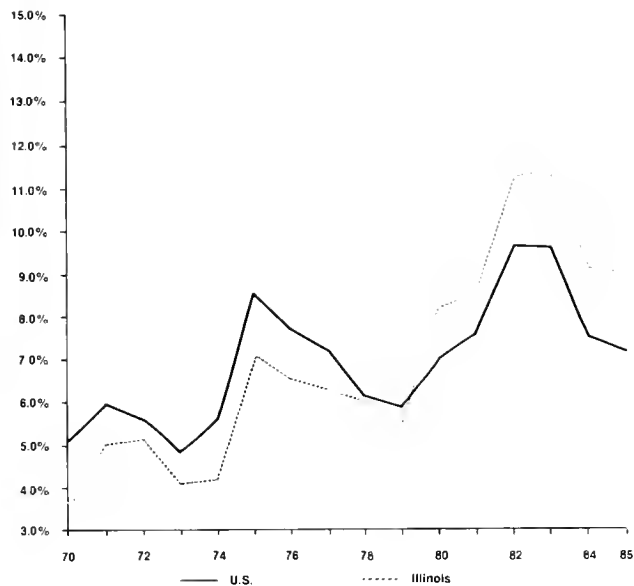
U.S. ———   Illinois ·······

Chart 2. Employment Ratio (employment/population)
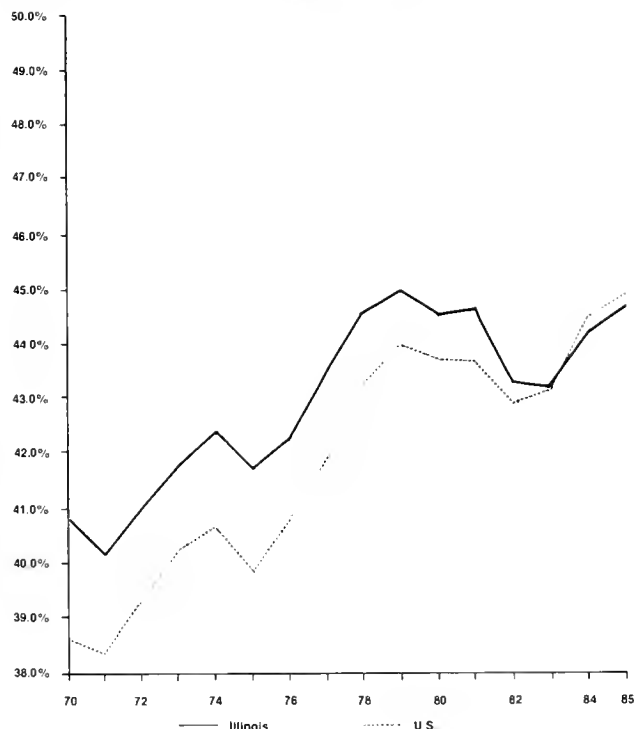
Illinois ———   U S ·······

Chart 3. Illinois Industrial Employment (proportion of industry to total nonagricultural)

manufacturing ———   services ·······
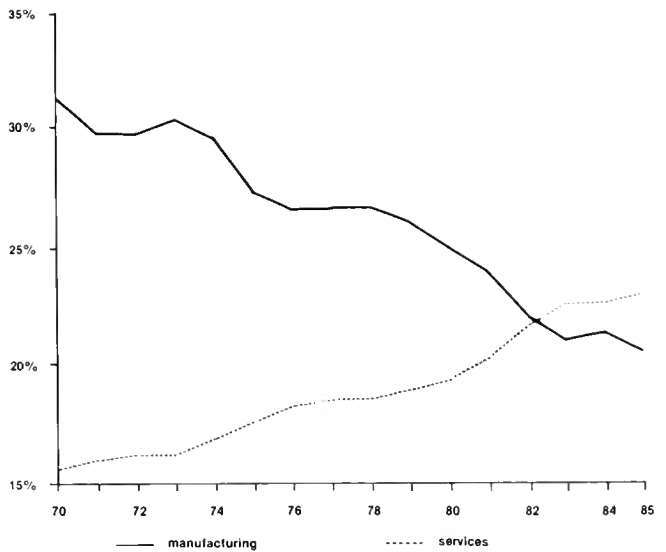
Chart 4. US Industrial Employment (proportion of industry to total nonagricultural)

manufacturing ———   services ·······
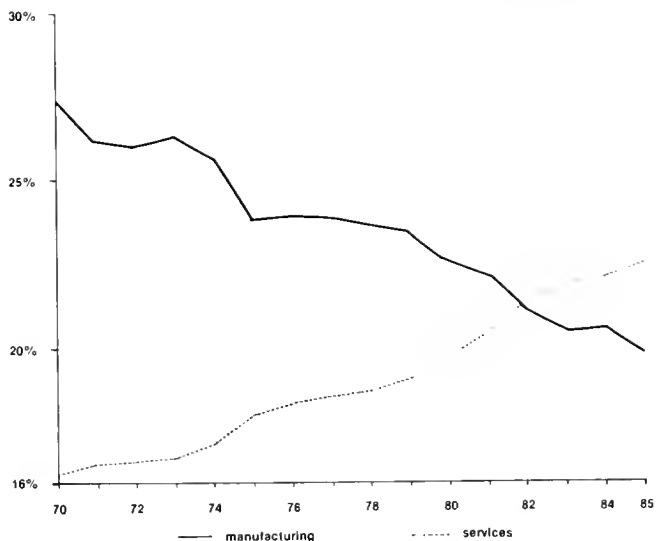
Businesses tend to locate where they can be assured of a continued supply of skilled workers. As workers relocate, employment tends to follow. Likewise, if a region loses skilled workers due to changing geographic preferences, employment would also be expected to decrease in the long term. However, although Illinois has experienced population outflows, employment has continued to increase. Thus, the increase in Illinois employment is an indication that the Illinois economy has been improving.

Charts 3 and 4 present Illinois and US employment in manufacturing and services as a proportion of total nonagricultural employment. They show similarities for the country and Illinois. Manufacturing employment has decreased sharply while services and trade employment has increased for both Illinois and the

United States. However, differences in the experience of Illinois compared with the nation provide insights in understanding the change in the relative economic status of Illinois (see Charts 3 and 4).

Even though the Illinois economy has shown the same trends as the nation as a whole, the deterioration in Illinois manufacturing has been at a faster rate. US manufacturing employment fell from 27.3 percent of total employment in 1970 to 19.8 percent in 1985, a decline of 27.5 percent. In Illinois, manufacturing employment fell from 31.3 percent of the total employment to 20.6 percent over the same period, a 34 percent decline.

### A New Interpretation of Historical Evidence

There is no doubt that the loss of jobs in the traditionally strong manufacturing sector of the Illinois economy has contributed to the current relatively high unemployment rates in Illinois. The traditional interpretation of such developments, as discussed earlier, is that high unemployment rates and loss of manufacturing jobs reflect a weakening of the Illinois economy. It is important to recognize, however, that a fundamental change has occurred in the US economy as a whole. Corresponding changes in the Illinois economy are necessary for its long-term strength.

The strength of the Illinois economy over much of the century has been in its manufacturing sector, but manufacturing has not always been the base of the Illinois economy. As in the United States as a whole, agriculture served as the Illinois economy's basic industry through much of its early history. By moving earlier to a manufacturing-based economy, Illinois was assured of a strong economy throughout much of the twentieth century.

The US economy is again in transition, moving away from manufacturing toward a services economy. In the long term, the Illinois economy would be strengthened by adjusting quickly to the shift. As it turns out, Illinois has begun to make the transition. As shown in Chart 3, services employment has increased from 15.6 percent of total nonagricultural employment in 1970 to 23.1 percent in 1985; an increase of 48 percent. During the same period, US service employment increased from 16.3 percent of total nonagricultural employment to 22.5 percent, an increase of 38 percent. Although Illinois started the transition from manufacturing to services later than the country as a whole, it has been changing more rapidly. Thus, it is plausible to expect that Illinois unemployment rates will fall relative to the US average as the transition is completed.

Data from 13 states, presented in Charts 5, 6, and 7, substantiate the view that the US economy is in transition. All the states in the sample have a fairly large population, and none depends on agriculture as its basic industry. The states are divided into two basic types. Type A states either began later or have not yet begun to move from manufacturing to services and include Illinois, Indiana, Michigan, Ohio, Pennsylvania, and Wisconsin. Type B states began the transition from manufacturing to services fairly early and include Arizona, California, Florida, Massachusetts, New Jersey, New York, and Texas.

Chart 5. Industrial Employment for Type A States
**(proportion of industry to total nonagricultural)**
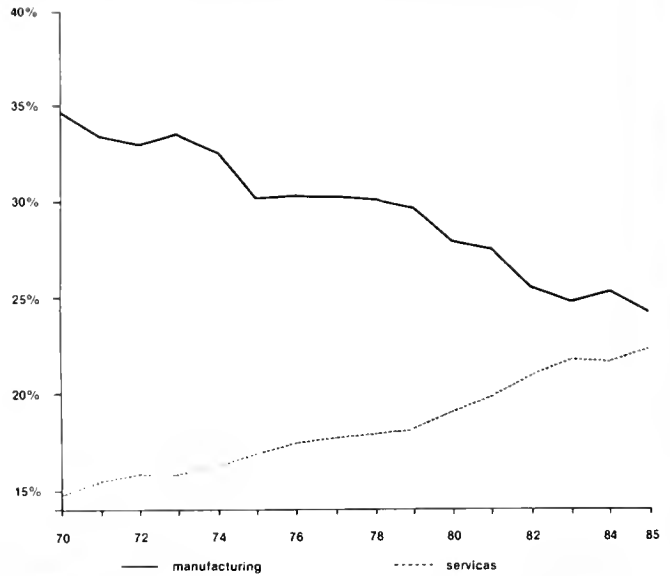
Chart 6. Industrial Employment for Type B States
(proportion of industry to total nonagricultural)
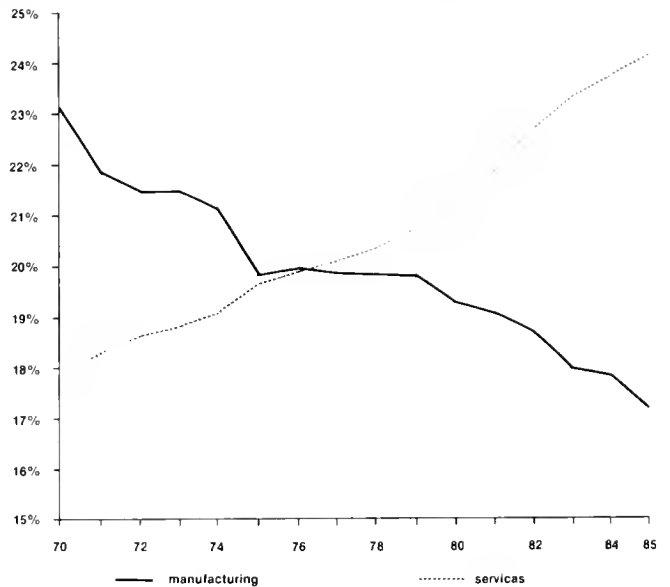
Charts 5 and 6 show industrial employment as a percent of total nonagricultural employment for both types of states. Type A states, on average, have not yet reached the point where employment in services is more important than in manufacturing. On average, services employment in Type B states became more important than manufacturing employment in 1976. Type B states have not only adjusted faster to changes in the US economy but they did so earlier than Type A states.

Chart 7 presents unemployment rates for the US, Type A states, and Type B states since 1981. Over this period Type A states have consistently had unemployment rates much higher than the US rates. During the

Chart 7. Unemployment Rates (unemployment/labor force)
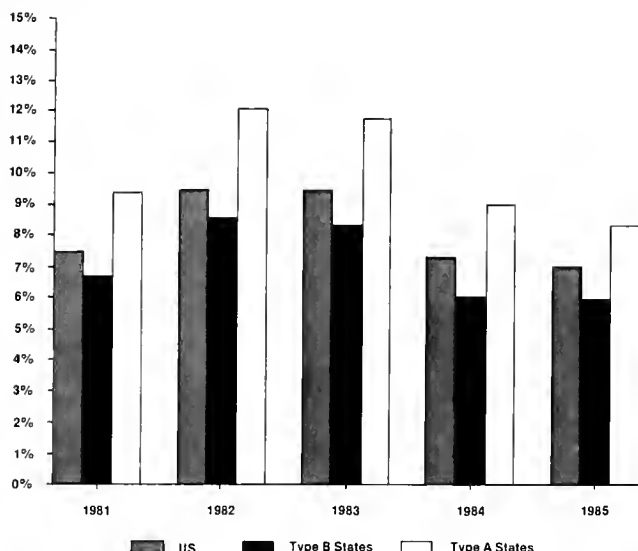
same period Type B states have consistently had lower unemployment rates than the US. However, the gap between Type A and Type B unemployment rates has narrowed somewhat in the last two years.

The implication for Illinois is that current high unemployment rates are short term and are a result of the transition from a manufacturing to a service-based economy. If this view is correct, Illinois will be better off in the long term by encouraging the transition to occur as quickly as possible.

Notes

[1]Issues of *Employment and Earnings*, published by the Bureau of Labor Statistics, have detailed information on how industrial establishment data is gathered.

[2]For detailed information on the estimation of survey labor force statistics see a current issue of *Employment and Earnings* published by the Bureau of Labor Statistics. In addition to the United States, survey data for the 13 states and regions—New York, California, Illinois, Ohio, New Jersey, Pennsylvania, Michigan, Texas, Massachusetts, North Carolina, Florida, Los Angeles SMSA (standard metropolitan statistical area) and New York SMSAs, are considered reliable enough to be used directly from the *Current Population Survey.*

[3]Detailed information on the estimation of local area and region labor force statistics can be found in the Bureau of Labor Statistics *Manual for Developing Local Area Unemployment Statistics.*

ROGER E. CANNADAY, EUGENE W. STUNARD, AND MARK A. SUNDERMAN

Property Tax Assessment: Measures and Tests of Uniformity Applied to Chicago Condominiums

An important issue of concern to taxpayers, assessors, and others is the uniformity of property tax assessments. Ideally, for a given class of property in a particular jurisdiction the assessed value should be the same fraction of the market value for each such property. Unfortunately, the achievement of this ideal is difficult in practice. Indeed, the sheer complexity of the problem insures that there will be some inequity. The questions, thus, are what level of inequity is acceptable and how is the inequity to be measured and tested.

Several measures and tests have been developed to address the issue of assessment uniformity. In a recent study on which this article is based, these measures and tests were applied to a sample of Chicago condominiums. The purpose of this article is to demonstrate the possibility of inconsistent results when these measures and tests are used.

A key problem in applying measures and tests of assessment uniformity is to develop estimates of market value. Most often, actual sales prices are used as a proxy for market value. There are at least two potential difficulties with this practice. One difficulty arises if sales prices are not all adjusted to the date for which assessed values are estimated. The second difficulty emerges if the properties that sold during that year are not representative of all properties in that jurisdiction (or sub-area being tested in that jurisdiction).

The use of a price index is a means of overcoming these difficulties, at least to some extent. With a price index it is possible to adjust sales prices for date of sale so that market values are all estimated for the same date. Further, use of a price index allows sales over a period of several years to be used, thereby increasing the probability that the sample of properties is representative of all properties.

There are two basic types of inequity that may be present if assessments are not uniform. The first type is horizontal inequity, defined as a situation in which persons having similar properties with the same market value pay different property taxes because their

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assessed values are not the same. The second type is vertical inequity, defined as a difference between the ratios of assessed value to market value that is systematically related to price level. For example, if lower-priced properties are systematically assessed at a higher percentage of market value than are higher-priced properties, the vertical inequity is characterized as regressive; the reverse is characterized as progressive.

exact form of this relationship varies by the type of test used, as can be seen in Table 1. For example, relating predicted sales prices directly to their corresponding assessed values is proposed by Paglin and Fogarty. Statistical techniques may be used to develop estimates of the parameters b_0 and b_1 for Test (1). There is no vertical inequity if the estimated b_0 is not significantly different from zero. Note that if b_0 is not significantly

Table 1. Tests of Vertical Inequity

Test	Equation	Question	Proposed by
(1)	$AV = b_0 + b_1 SP$	$b_1 = 0$?	Paglin & Fogarty
(2)	$AV/SP = a_0 + a_1 SP$	$a_1 = 0$?	IAAO
(3)	$AV = g_0 + g_1 SP + g_2 SP^2$	$g_0 = g_2 = 0$?	Bell
(4)	$AV = q_0 SP^{q_1}$	$q_1 = 1$?	Cheng, Reinmuth
(5)	$SP = t_0 AV^{t_1}$	$t_1 = 1$?	Kochin & Parks

Note: AV = Assessed Value
SP = Predicted Sales Price

Measures of Horizontal Inequity

Even if there is no systematic price-related inequity (that is, no vertical inequity), studies of assessment uniformity will always find some horizontal inequity. The inequity reflects imperfections in assessment procedures, including, perhaps, a lack of certain information needed to estimate market value. Therefore, no test of whether or not there is horizontal inequity is needed. Rather, a measure of the degree of nonuniformity is needed.

The most commonly used measure of horizontal inequity is the coefficient of dispersion. The International Association of Assessing Officers (IAAO) provides guidelines for a reasonable level of assessment uniformity based on the coefficient of dispersion, "Coefficients of dispersion with respect to the median assessment ratio for single-family residences generally should be less than 15 percent, and for areas of newer and fairly similar residences, less than 10 percent." (IAAO Assessment Standards Committee, *Standard on Assessment-Ratio Studies*, 28 September 1980, p. 12).

According to the IAAO, the second most widely used measure of horizontal inequity is the coefficient of variation. A third measure, the degree of horizontal inequity, is suggested by Paglin and Fogarty in an article in the *National Tax Journal* (December 1972, p. 559).

Tests of Vertical Inequity

While there will always be some level of horizontal inequity, there may or may not be any statistically significant vertical inequity. A summary of five alternative tests of vertical inequity is presented in Table 1.

The predicted sales price is estimated simply by adjusting the actual sales price for the date of sale. This is accomplished by applying a price index developed by using statistical techniques. All sales prices are adjusted in this manner to reflect what the price would have been on 1 January 1983, the date for which assessed values were obtained for the study on which this article is based. The test to determine whether there is significant vertical inequity is then conducted by relating predicted sales price to assessed value. The

different from zero, then b_1 should be equal to the specified ratio of assessed value to market value (that is, 0.16 for condominiums in Cook County). If b_1 is not equal to the specified ratio, then it could be used by the state as a basis for applying equalization factors. Similar interpretations apply to the other tests.

The most drastic break with traditional tests for measuring vertical inequity is proposed by Kochin and Parks. They assert [*Property Tax Journal*, March 1984, p. 511] that the tests ...

> in widespread use and recommended by the assessors' professional associations and textbooks are incorrect. The procedures are biased in such a way that they would indicate systematic underassessment of high-value properties and over-assessment of low-value properties even if the assessments are in fact uniform. Although this statistical bias has been recognized in the published literature, the suggested "corrections" for the bias are wrong, and the fact that there is a simple approach that is not prone to the error has gone unrecognized.

Kochin and Parks purport to show that Tests (1), (2), and (4), and by implication Test (3), fail as tests for vertical inequity because in each case the application of standard statistical techniques results in biased estimates that will persist even with large samples. Their method for eliminating this bias is to reverse the positions of predicted sales price and assessed value in the test equation; compare the equations for Tests (4) and (5). Based on Test (5), there is no vertical inequity if t_1 equals 1.

Development of the Price Index

The data for this study consist of 524 sales of condominium units in 11 high-rise buildings in three areas of the North Township—the Gold Coast, Streeterville, and Sandburg Village. The sales occurred during the period from January 1979 to July 1985. Sales prices range from $38,000 to $812,000 and the range for living area is from 519 to 3,830 square feet. It was thought necessary to include a wide range of prices since one key aspect of the purpose of this study is to demonstrate tests for systematic, price-related inequities in assessment. One price index was

developed on the basis of the combined sample for all three areas. However, it is suspected that each of these three areas may be a distinct sub-market and a separate price index for each of the three areas may be more appropriate. The price index for the Gold Coast area is based on 109 sales in four buildings located within a three block area on the west side of North Lake Shore Drive. The Streeterville area price index is based on 295 sales in three buildings located near the intersection of Michigan Avenue and Chestnut Street, on the east side of Michigan Avenue. The Sandburg Village price index is based on 120 sales in four buildings clustered around the intersection of Schiller Street and Sandburg Terrace. The Sandburg Village buildings are only about five blocks west of Lake Shore Drive (the prestige street address in the Gold Coast area) and were thought to be a logical choice for units that sell in the lower priced segment of the market.

Tests for Assessment Uniformity

The two types of inequity that may be present when assessments are not uniform are horizontal and vertical inequity. The results reported below indicate the inconsistencies among three measures of horizontal inequity and five tests of vertical inequity.

Measures of Horizontal Inequity

As indicated previously, there is horizontal inequity in the assessment of condominiums in this sample and the three measures presented in Table 2 provide an indication of the extent of this inequity. The coefficients of dispersion are all below 15 percent, so they meet the standard specified by the IAAO for residential areas. The horizontal inequity is lowest for the Sandburg Village area on the basis of all three measures. However, the measures are not consistent in ranking the level of horizontal inequity for the other areas.

Tests of Vertical Inequity

The five tests of vertical inequity presented earlier in Table 1 were conducted for the entire sample and for each of the sub-area samples. Tests based on the entire sample and on the Streeterville sub-area sample consistently show that there is vertical inequity. However, the results are mixed for the other two sub-areas.

For the Gold Coast sub-area sample, opposite conclusions are reached on the basis of the four more traditional tests and the Kochin and Parks test. The four traditional tests consistently indicate that there is vertical inequity while the Kochin and Parks test indicates that there is not.

Table 2. Measures of Horizontal Inequity

	Coefficient of Dispersion	Coefficient of Variation	Degree of Horizontal Inequity
Combined Area	12.83	17.96	0.2105
Sandburg Village	6.51	7.97	0.0785
Streeterville	13.72	20.13	0.1912
Gold Coast	13.86	17.48	0.1302

Table 3. Indication of Regressivity

	Alternative Tests of Vertical Inequity Based on Streeterville Sample				
	Predicted Assessed Value to Sales Price Ratio				
Sales Price	Test (1)	Test (2)	Test (3)	Test (4)	Test (5)
$200,000	.1153	.1226	.1227	.1167	.1177
400,000	.1018	.1076	.1076	.1046	.1115
600,000	.0973	.0926	.0922	.0981	.1080
800,000	.0950	.0776	.0767	.0938	.1056

NOTE See Table 1 for description of Tests (1) through (5).

The results for the Sandburg Village sub-area sample also are inconsistent. The critical parameter for three of the four traditional tests is not significantly different from the appropriate magnitude, zero or one. The conclusion on the basis of the traditional tests likely would be that there is no vertical inequity for the Sandburg Village sample. However, the opposite conclusion would be reached on the basis of the Kochin and Parks test since the critical parameter is significantly different from one, implying that there is vertical inequity.

When there is vertical inequity, it can be because taxes are regressive or progressive. For the combined data set and the Streeterville sub-area, all five tests consistently indicate that taxes are regressive for our sample. An indication of the degree of regressivity is presented in Table 3 for the Streeterville sub-area. Test (3) indicates the highest degree of regressivity. The predicted assessed value to sales price ratio drops from 0.1227 for a sales price of $200,000 to 0.0767 for a sales price of $800,000. Based on Test (5), the Kochin and Parks test, the ratio drops from 0.1177 at $200,000 to 0.1056 at $800,000 indicating a much lower degree of regressivity.

For the other two sub-areas, the results are mixed. Tests (1), (2), and (4) indicate that taxes are uniform for the Sandburg Village sub-area, while Test (3) indicates regressivity and Test (5) indicates progressivity. For the Gold Coast sub-area, Tests (1) through (4) indicate regressivity while Test (5) indicates uniformity; that is, the Kochin and Parks test gives a different result from the more traditional tests.

Conclusion

This study explored the possibility of inconsistent results from alternative measures and tests of assessment uniformity for a sample of Chicago condominiums. As expected, the results indicate the existence of horizontal inequity; that is, units with the same market values having different assessed values. However, based on the coefficient of dispersion the level of horizontal inequity is within the range specified by the IAAO as acceptable.

The results also consistently show that there is vertical inequity, systematic price-related differences in level of assessment, for the entire sample and the Streeterville sample. However, opposite conclusions would be reached on the basis of the traditional tests versus the Kochin and Parks test for the Gold Coast

and Sandburg Village samples. It should be remembered that these results may be applicable only to this specific data set. It is not known how representative this data set is of all the condominium units in the 11 buildings of our sample, in the study area, or in the North Township.

There are numerous extensions of this study that can be considered for future research. For example, a similar study based on 1984 assessed values would be of particular interest. Cook County is divided into four quadrants for assessment purposes and each quadrant is reassessed every four years. The quadrant in which the current study area is located was assessed in 1980 and reassessed in 1984. The 1983 assessed values used in this study reflect 1980 assessments updated to 1983 by the application of county-wide equalization factors. In addition, it is understood that the procedures for estimating assessed values of condominiums were improved by the Cook County Assessors Office between 1980 and 1984. A study based on 1984 assessed values could detect whether there was any improvement in assessment uniformity, at least for our sample.

A second possible extension of this study is to attempt to resolve the question of which test for vertical inequity is the most appropriate. It is important to resolve this question since we reach opposite conclusions on the basis of the traditional tests and the Kochin and Parks test for two of our sub-area samples, just as Kochin and Parks did for their King County, Washington, sample.

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CARLA TIGHE

Illinois Waterways

Illinois lakes and rivers contribute an important source of transportation for the state. Illinois has 1,110 miles of navigable waterways and also borders Lake Michigan for 60 navigable miles, and thus has access to the South via the Mississippi and to the Atlantic via the Great Lakes/St. Lawrence Seaway system. For this reason, Illinois has the largest inland commercial navigation system in the United States. The workings of this mode of transportation, however, are not widely understood. This article focuses on these workings, looking at the extent of the water transport system, the existing publicly and privately maintained infrastructures, and the role of Illinois waterways in the state's economy.

About the System

The chart shows contribution of each Illinois river to the 1,110 navigable miles in Illinois. The Mississippi, Illinois, and Ohio rivers constitute 91 percent of the total Illinois navigable mileage. Most traffic on the Lake Michigan shore is by what is known as deep-draft vessels. (Draft is the difference between the water level and the lowest point of the vessel under water). The Great Lakes/St. Lawrence Seaway can accommodate ships having drafts of up to 25.75 feet. But the maximum draft on the inland waterway system is only nine feet. Therefore, barges rather than ships are used on Illinois rivers.

Infrastructure

A water transportation system depends on more than just river mileage. Also necessary are terminal facilities providing docks and cargo-handling. Illinois has quite an adequate supply of such facilities. Of the 102 counties in the state, 43 are located on navigable waterways, and 37 counties have one or more terminals. In total, 344 terminals operate in the state, each having one or more ports. Most terminals act as intermodal transfer points, where goods are moved from ships or barges to trucks or rail cars, and vice versa. Both private and public terminals border the shores of Illinois waters.

Approximately 75 percent of all of the state's terminals are privately owned by companies that ship their own products exclusively. The other 25 percent, or 86 terminals, are operated as public utilities.

The most active forms of government involvement in water transportation is achieved through 11 port districts created by the Illinois General Assembly in order to promote, plan, develop, and operate water ports. Their purpose is to attract recreational as well as commercial and industrial projects to Illinois shores. Port districts operate as separate entities and, for the most part, are financially independent of the remainder of the state government.

Illinois Inland Waterways*

a (.54%)
b (2.16%)
c (1.26%)
d (2.7%)
h (12.%)
e (26.2%)
g (52.3%)
f (2.7%)
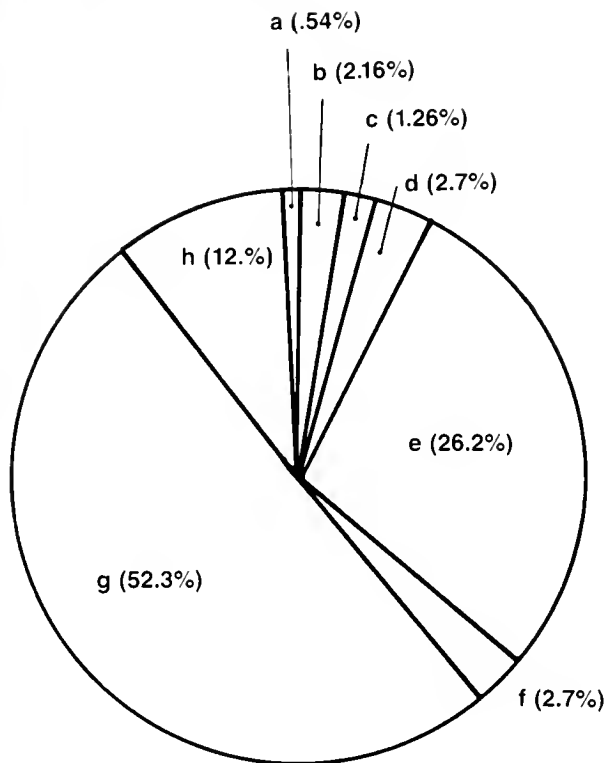
a = Calumet River
b = Cal-Sag Channel (includes Little Calumet River)
c = Chicago River
d = Chicago Sanitary and Ship Canal
e = Illinois River (includes Des Plaines River)
f = Kaskaskia River
g = Lake Calumet
h = Mississippi River
i = Ohio River
j = Waukegan Harbor

Source: Illinois Department of Transportation
*Lake Michigan not included

Another way in which government affects water trade is through the use of Foreign Trade Zones. Authority to operate Foreign Trade Zones is granted to port districts by the federal government. Foreign Trade Zones, not considered part of the US, are enclosed areas located near major ports. Therefore, goods within the zone are not subject to US Customs laws. Foreign businesses can use the zones as places to keep commodities subject to import quotas, to exhibit items to American investors, or to combine imported and American goods. Thus the presence of Foreign Trade Zones in Illinois can attract both export and import trade by providing cost savings that otherwise would be foregone. Illinois presently has four Foreign Trade Zones, in Chicago, Tri-City Harbor (near Granite City), Peoria, and the Quad Cities. Another zone will open soon near Lawrenceville.

Economic Impact

Clearly, a substantial lake and river network actively operates within Illinois. But how much does this system mean to the Illinois economy? The most recent export and import statistics available are for 1983. During that year, deep-draft imports totaled 3 million tons, and deep-draft exports equaled 800,000 tons, making deep-draft vessels relatively more important for imports.

Barge loadings, in contrast, were of a much greater order of magnitude, 56.7 million tons. Much of Illinois exports rely upon barge transport. In 1980, Illinois waterborne exports and imports combined totalled 65.7 million tons valued at $20.6 billion. Overseas waterborne exports for the state were 37.2 million tons worth $9.4 billion. During that same year, the gross state product for 1980 was $138.5 billion. Hence, Illinois overseas waterborne exports represented 7 percent of gross state product.

A large proportion of Illinois exports are agricultural commodities such as corn, soybeans, and wheat. In 1980, Illinois was the leading agricultural exporting state in terms of both tonnage and value. The state was also the fourth largest manufacturing exporter. Other goods shipped on the inland waterway system include coal, chemicals, petroleum, sand, and gravel. The products shipped on the Great Lakes/St. Lawrence Seaway system consist primarily of coal, iron ore, and iron and steel products.

The waterborne commerce system also plays a key role in distributing imported goods throughout the state. Illinois imported 28.5 million tons on its waterways in 1980, valued at $11.3 billion. Not surprisingly, about 60 percent were petroleum products, and another 25 percent were manufactured goods.

Clearly, Illinois waterways provide an important source of transportation. Barges and ships are used both to distribute goods within the state and to allow Illinois to trade with other states and countries. The extensive navigable mileage, plus a well-organized infrastructure, provide cheap and efficient means of carrying millions of tons of cargo each year. These factors make Illinois waterways the largest inland commercial navigation system in the country.

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Illinois Business Indexes

The Illinois economy is expected to continue its expansion over the next two quarters. As Chart 1 shows, both the three-month (MA3) and six-month (MA6) moving average indexes increased throughout most of 1986. Further, the three-month moving average remained above the six-month moving average during virtually all of the past year. The indexes continued their strong upward movement through January 1987, indicating future growth in the Illinois economy.

Construction activity in Illinois has expanded in the past year. The expansion in activity (as measured by building permits) has been widespread, as most sectors of the Illinois economy have increased substantially over previous levels. In the past year, monthly building permits for residential housing units increased an average of 28 percent over months for the previous year. The value of residential housing units had an even larger increase, 49 percent over the previous year. The value of industrial buildings increased an average of 89 percent over the previous year. In addition, the value of stores and other mercantile buildings rose 49 percent over the previous year. The only series that showed declines on average was the value of office, banks, and professional buildings. It had an average monthly decrease of 21 percent for the past year.

ILLINOIS BUSINESS INDEXES

	Percent Change Jan 1986-Jan 1987	Jan 1987	Dec 1986	Nov 1986	Oct 1986	Jan 1986	Dec 1985
Leading Indicator(MA3)	13.75[h]	14.64	11.10	10.71	7.98	0.89	−0.26
Leading Indicator(MA6)	10.56[h]	11.22	9.16	8.60	7.17	0.66	−0.43
Employment-manufacturing (in thousands)[e]	−1.09%	922.3	922.2	922.5	921.4	932.5	943.1
Average weekly hours-manufacturing[e]	1.47%	41.3	41.6	41.3	41.4	40.7	41.9
Weekly earnings-manufacturing[e]	3.69%	$444.80	$446.37	$443.56	$443.39	$428.98	$442.88
Help wanted advertising-Chicago (1969 = 100)[a]	7.69%	98	121	109	105	91	104
Help wanted advertising-St. Louis (1969 = 100)[a]	−2.90%	67	62	71	63	69	67
Retail sales (in millions)[b]	1.67%	$4,637	$6,944	$5,651	$5,765	$4,561	$6,315
Coal production (in thousands of tons)	−10.05%	5,229	4,882	4,201	5,440	5,813	4,632
Petroleum products (in thousands of barrels)[e]	−17.42%	2,200	2,100	1,990	2,158	2,664	2,533
Vendor performance[g]	19.57%	55.0%	56.0%	56.0%	54.0%	46.0%	46.0%
Building permits (in thousands)							
Residential housing units	14.03%	2.259	2.971	4.169	4.087	1.981	3.068
Value of residential housing	42.75%	$163,055	$205,774	$283,167	$273,180	$114,224	$165,595
Value of nonresidential construction							
Industrial buildings	−32.41%	$12,776	$103,043	$13,277	$44,107	$18,901	$13,340
Office, banks, and professional buildings	9.07%	$61,793	$24,216	$21,526	$48,283	$56,652	$61,950
Stores and other mercantile buildings	125.61%	$24,415	$20,906	$23,708	$28,208	$10,822	$21,667
Other	77.88%	$3,056	$2,865	$5,141	$4,593	$1,718	$4,534
Consumer price index (December 1977 = 100)							
North Central US[c]	0.62%	—	177.1	—	176.5	—	176.0
North Central/population more than 1,250,000[c]	0.89%	—	181.0	—	180.3	—	179.4
North Central/population 385,000 to 1,250,000[c]	1.09%	—	176.1	—	174.0	—	174.2
North Central/population 75,000 to 385,000[c]	0.23%	—	171.9	—	172.3	—	171.5
North Central/population less than 75,000[c]	−0.58%	—	171.6	—	171.7	—	172.6
Chicago (1967 = 100)	2.45%	334.3	331.0	328.7	331.3	326.3	325.9
St. Louis (1967 = 100)	1.33%	326.7	—	323.8	—	322.4	—
		1986:III	1986:II	1986:I	1985:IV	1985:III	1985:II
Personal income (in millions)[d,e,f]	5.45%	$178,477	$178,797	$174,364	$173,178	$170,458	$169,561
Per capita personal income[d,e,f]	4.82%	$15,392	$15,442	$15,082	$15,001	$14,788	$14,732

[a]The Conference Board, *Help Wanted Advertising*, January 1987, [b]Latest month projected by BEBR; [c]Percent change between December 1985 and December 1986; [d]Percent change between 1985-III and 1986 III, [e]Recent month is preliminary figure, [f]Seasonally adjusted at annual rates, [g]Percentage of companies receiving slower deliveries; and [h]Represents absolute change (percent change not relevant).

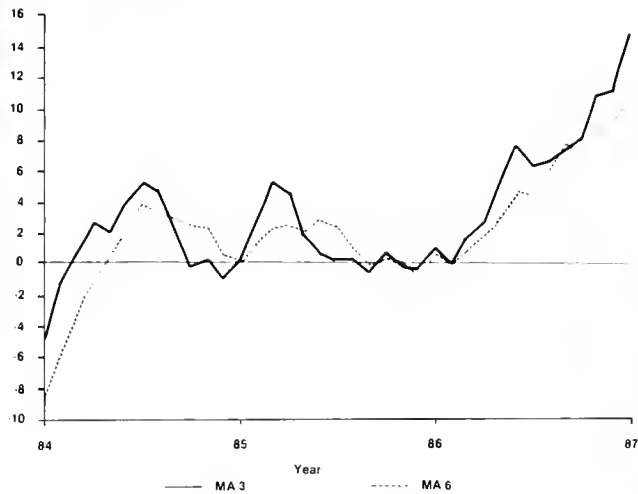## Chart 1. Composite Leading Indicators (Average Percent Change in Base Indexes)

Legend: —— MA 3   ····· MA 6
X-axis: Year (84, 85, 86, 87)
Y-axis: -10 to 16

Chart 2. Residential Housing (thousands of units)

Month	Value
Feb 86	1.573
March	3.045
April	6.362
May	6.093
June	5.141
July	4.992
Aug	4.326
Sept	5.502
Oct	4.087
Nov	4.169
Dec	2.971
Jan 87	2.259

Chart 3. Value of Residential Housing (thousands of dollars)

Month	Value
Feb 86	$111,698
March	$204,774
April	$374,451
May	$374,180
June	$320,542
July	$345,144
Aug	$296,180
Sept	$359,088
Oct	$273,180
Nov	$283,167
Dec	$205,774
Jan 87	$163,055

Chart 4. Value of Industrial Buildings (thousands of dollars)

Month	Value
Feb 86	$20,295
March	$21,632
April	$21,912
May	$49,990
June	$27,825
July	$36,706
Aug	$20,324
Sept	$46,663
Oct	$44,107
Nov	$13,277
Dec	$103,043
Jan 87	$12,776

Chart 5. Value of Office, Banks, and Professional Buildings (thousands of dollars)

Month	Value
Feb 86	$38,003
March	$8,196
April	$32,654
May	$29,418
June	$38,042
July	$33,019
Aug	$80,030
Sept	$25,356
Oct	$48,283
Nov	$21,526
Dec	$24,216
Jan 87	$61,793

Chart 6. Value of Stores and Other Mercantile Buildings (thousands of dollars)

Month	Value
Feb 86	$17,452
March	$38,386
April	$36,378
May	$44,558
June	$31,538
July	$41,720
Aug	$38,029
Sept	$43,128
Oct	$28,208
Nov	$23,708
Dec	$20,906
Jan 87	$24,415

Illinois
Business
Review

Illinois Economic Outlook

Illinois Seasonally Adjusted Employment

	History				Forecast			
	86:1	86:2	86:3	86:4	87:1	87:2	87:3	87:4
Total (private, nonfarm)	4041	4041	4075	4091	4087	4090	4100	4108
Mining	26	25	25	25	24	23	23	22
Construction	173	175	180	182	177	173	170	168
Manufacturing	936	922	920	923	907	901	900	897
Durable manufacturing	572	563	563	563	547	541	539	536
Primary metals	56	55	55	55	54	52	52	51
Fabricated metals	111	110	111	111	108	106	107	106
Nonelectrical machinery	141	138	136	137	129	126	125	125
Electrical equipment	121	118	118	118	117	116	116	115
Miscellaneous durables	144	142	142	142	140	140	140	139
Nondurable manufacturing	363	359	356	354	359	360	361	361
Food products	91	90	88	90	90	90	91	90
Printing and publishing	107	106	105	105	105	104	104	104
Chemicals	57	56	56	56	57	58	59	59
Miscellaneous nondurables	109	107	107	108	108	107	107	107
Utilities and transportation	278	277	278	277	275	273	271	270
Wholesale and retail trade	1169	1177	1191	1200	1207	1213	1218	1223
Services	1114	1120	1133	1138	1144	1151	1158	1166
Finance, insurance and real estate	344	345	348	350	354	357	359	362

Bureau of Economic and Business Research

I llinois private nonfarm employment showed a rise of 16,000 workers in the last quarter of 1986 according to figures released by the Bureau of Labor Statistics. (Private nonfarm employment excludes government and farm workers.) The Illinois Econometric Model forecasts that employment will be lower for the first two quarters of 1987 as compared to the fourth quarter of 1986. However, employment is expected to increase above 1986 levels for the last two quarters of 1987. Although jobs are likely to decrease in the first quarter of 1987, the accompanying chart illustrates the steady job growth for Illinois this year. The model predicts a level of employment of 4,108,000 workers by the fourth quarter of 1987, a 0.42 percent increase over last year.

Illinois Total Private Nonfarm Employment (in thousands)

Illinois
Business

Review

JOHN F. DUE

Proposed Application of the Illinois Sales Tax to Services

$\mathbf{T}$ he issue of the application of the Illinois sales tax to services, under serious discussion on several occasions in the past, was revived by Governor Thompson's Budget Message proposal for the 1987–88 fiscal year, to extend the sales tax to "include personal, repair, entertainment, and business services effective 1 January 1988." The issue was also discussed, without recommendation, in the 25 February 1987 report of the Revenue Review Committee, chaired by Douglas L. Whitley. Because of strong opposition, primarily from the business community, the governor indicated in mid-May that he was dropping the proposal; but the issue is certain to arise again.

The Arguments for the Taxation of Services

Under the usual standards of taxation, there is no basic reason why sales taxes should be confined to commodities; the tendency to do so, with minor exceptions, in Illinois and many states, is more the product of historical accident than logic. The objective of a sales tax is to distribute the costs of governmental services in relation to consumer spending, with the usual and reasonable assumption that the taxes are shifted forward by the firms from which the tax is collected to the consumers of the products. Acquisition of service by households constitutes consumption expenditure in the same fashion as the purchase of commodities; there is no basic difference between the two that warrants different tax treatment. Consumers gain satisfaction from services just as they do from commodities.

Application of sales tax to consumer services offers several specific advantages. By application of the tax to services, a given sum of revenue can be raised by a lower tax rate, thus lessening pressure to evade and to make purchases outside the state. Discrimination in favor of persons who spend greater than average percentages of their incomes on services would be eliminated, as well as the incentive to spend more on tax-free services and less on taxable commodities. On services provided by firms already registered because they make commodity sales, application of the tax to the services they render would simplify both compliance and enforcement since all their charges would be taxable, instead of only part of them. The services sector of the economy is growing more rapidly than other sectors, and thus the elasticity of revenue relative to changes in total income would be increased.

It is also commonly argued that the taxation of services would make the tax less regressive or more progressive, since the portion of income spent on services rises as incomes rise. This argument would be valid if, in fact, all services could be taxed, but some of the most progressive ones, relative to income, cannot be reached: foreign travel, expensive education out of state, personal/household services, and the like. Various studies suggest that on the whole taxation of services does not significantly alter the distributional pattern, and taxation of some types will make the tax more regressive. But the other arguments for taxing services are significant.

Some objections raised against taxing services make no sense whatever. For example, it is sometimes argued that since persons pay tax on the purchase of a commodity it is unfair to require them to pay for cleaning or repairing it. There is no logic to such an argument; expenditures for cleaning and repair are consumption expenditures, just as those on the original purchases. Service establishments complain about potential compliance costs, but at present purely service establishments are favored over sellers of commodities.

The Primary Problem with General Taxation of Services

Despite the valid arguments for the taxing of services, in doing so one encounters a very basic problem, that of distinguishing between services rendered to household consumers and those supplied to business firms. As noted earlier, the rationale of sales taxation is that of distribution of tax burden in relation to consumer spending, through taxation of sales to household consumers. To tax business inputs, that is, purchases for business use, is contrary to this basic rationale, and is objectionable in several respects.

First, taxes resting on business inputs, like other business expenses, are certain, in general, to be passed forward to the final consumers. This occurs, however, in a haphazard and unplanned fashion as compared to the taxes on consumer expenditures on various goods, since the ratio of taxable inputs to final sale prices will vary widely. Secondly, and perhaps most seriously, taxing inputs places Illinois firms, particularly manufacturers, at a competitive disadvantage compared to those in states or in countries that have made strong efforts to exclude business inputs from tax. The European countries particularly have confined the burden of their sales taxes—which take the form of value-added taxes—to sales to final consumers. Thirdly, taxation of business inputs encourages firms to produce the inputs themselves or, with services, to provide the services with their own employees, rather than acquiring them from other firms and paying tax on their acquisition. By doing so they will pay tax only on the materials, not on the labor costs involved in production. Finally, choice of methods of production will be altered from the most efficient ones, since some are likely to be subject to more tax, per unit of final output, than others.

Illinois was very slow to recognize the desirability of confining sales taxes so far as possible to consumption purchases. There was little clear recognition, especially in early years of the taxes, of the undesirable consequences of taxing business inputs, and "taxing business" always has political appeal, even if it is illogical. To the lawyers who wrote and interpreted the law, it appeared perfectly logical to exempt sales for resale and sales of physical ingredients and parts from the tax as not being retail sales and yet to apply the tax to all other sales to business firms. The latter policy is completely illogical from an economic point of view and injures Illinois business.

The reluctance of Illinois and other states to change policy was, in part, recognition, stressed by tax administrators, that distinguishing between sales to consumers and sales for business use is difficult. Many commodities are used for both consumption and business use, and the retailer cannot determine use at the time of sales; even the purchaser may not know. The same system could be used for all business inputs as is now used for materials and parts and sales for resale: the purchaser can be required to present an exemption certificate to his supplier for all purchases for business use. This method is not foolproof, and some leakage would undoubtedly result, although West Virginia, and to a lesser extent Ohio, have used this system for decades without serious problems. But it is concern with the problem of escape that has particularly deterred Illinois from trying to exclude all business inputs, even though many business inputs are not used significantly for consumption purposes. Change has finally occurred in the last two decades by excluding industrial and farm machinery, items that are not used at all for consumption purposes, from tax.

Recognition of the undesirability of taxing business inputs when it is feasible to exclude them strongly suggests that if the sales tax is applied to services, it should not be applied to those services rendered primarily to business firms. For a simple example, suppose that bookkeeping firms are subject to tax. Their customers are given a strong incentive to hire additional staff and perform the bookkeeping within the firm. The firms most capable of doing so efficiently are the larger firms; smaller ones will be penalized by the tax. Similar considerations apply to legal services, computer systems analysis, and numerous others. Yet some of the proposals for taxing services make no distinction between these services rendered primarily to business and those of primary consumption use.

The problem remains, however, even if this route is followed, with services rendered primarily to households, but in part to business firms, as for example, repair. So long as no serious effort is made to exclude all purchases of goods by business firms, it can be argued that taxation of some services rendered to business firms is tolerable. But it must be recognized that this is only a second best approach, made necessary by the difficulty of excluding purchases for business use of goods and services of types also purchased for consumption.

In two respects, taxation of services provided to business firms is more serious than the equivalent taxation of commodities sold for business use. First, it

is much easier for firms to provide services by their own employees instead of acquiring them from independent firms than it is to produce commodities. It is relatively simple for firms—at least larger ones—to undertake their own bookkeeping, accounting, or legal work; it is not nearly as easy for a firm to commence to produce commodities—furniture, for example—now purchased.

The second difference relates to interstate transactions. The chief source of leakage of revenue with the present sales tax is that of interstate purchases. With commodities, at least a physical object crosses the state line, though it may be difficult to enforce payment of tax on the purchases. But with services performed outside the state, nothing tangible crosses the border. This situation is not likely to encourage persons to get haircuts or do household laundry outside the state, but it is likely to do so with other services. Suppose, for example, that truck repair is taxable. A trucking firm, not wishing to do its own repair work, will have this performed out of state—and there is no way that Illinois could possibly tax it. Out-of-state firms coming into the state to do repair or cleaning in theory could be forced to register and collect Illinois tax, but many would escape. If an attempt were made to tax advertising service, including amounts paid for radio and TV advertising, in areas near state borders, as for example the Quad cities, the advertising could be done on stations outside the borders. States that have taxed advertising, as for example Iowa, have found it so difficult that they have abandoned the attempt. Florida under its 1987 law is attempting to tax out-of-state advertising on the basis of the portion that appears in Florida, but it is doubtful that this rule is constitutional or enforceable.

Special problems are raised by professional services. One major set of these services—engineering, consulting of all types, computer work, accounting—are rendered primarily to business firms, and application of tax is therefore objectionable. A second set, which involves a large portion of total service expenditures, consists of medical, dental, and related hospital services, legal, and general educational service. Expenditures on some of these are progressive relative to income. But as a matter of general social policy, governments have been reluctant to tax them. Legal services, which are related to obtaining justice, do not appear suitable bases for taxation.

Tax Treatment of Services by Other States

When the sales tax was first introduced in the early 1930s (first in Mississippi in 1932), it was applied (with the exception of two states) to sales of tangible personal property, and thus all services were free of tax. As in Illinois, there was no particular logic to the sharp distinction between physical commodities and services; to many legislators, however, it appeared feasible to tax all commodities, but not to tax all services; thus for simplicity, none of the latter were included. Many services, such as medical, appeared to be unsuitable for taxation. The other type of reasoning was illogical but influenced legislators: the argument

that a tax on services was essentially a tax on the labor involved in rendering the services.

Only two states initially taxed all or virtually all services rendered to customers, as distinct from that provided by employees to employers, namely Hawaii and New Mexico, and these states continue to do so. South Dakota in 1979 broadened the base of its tax to cover virtually all services. But no other states followed this path (though it was discussed in several) until Florida added a very broad coverage of services by legislation in April 1987.

Gradually, however, as the states sought additional revenue, they brought in a few categories, under the sales tax or by a separate levy. Transient accommodations (hotels, motels) were ultimately made taxable in all states, at the state or local level. Public utility services, at least electricity, gas, water, and telephone, were made taxable in the majority of states, rental of taxable property in most, and admissions in a majority.

Ultimately, some states moved beyond these, to include a small additional number, and three states taxed a substantial range, but far from the general coverage of Hawaii, New Mexico, South Dakota, and, since April 1987, Florida.

Thus as the situation stands as of this writing, all states and/or local governments tax hotel and motel services; the majority tax rental of tangible personal property, and most utility services and admissions. Twenty-three states tax no other services, and two have added only laundry and dry cleaning; 14 have added a small number of additional services; and three (Iowa, Washington, and West Virginia) a broad range. Only Hawaii, New Mexico, South Dakota, and Florida apply tax to virtually all services.

These four states apply the tax by a general provision, making all services, commercial and professional, rendered to customers taxable except ones specifically exempted. New Mexico defines taxable gross receipts to include the amounts received "from performing services in New Mexico." Hawaii applies the tax "upon every person engaged or continuing within the state any service business." South Dakota applies the sales tax "upon the gross receipts of any person from engaging or continuing in the practice of any business in which a service is rendered."

The states that tax a broad, but not general, category of services do so by enumeration of taxable services; for example the Iowa law specifies 64 categories similar to those suggested for consideration in Illinois in the concluding section of the article, but including some business services. The states that tax services report no particular problems in doing so.

Other Problems with the Illinois Sales Tax

The Whitley Committee has reviewed the state sales tax in detail and pointed out features urgently needing change. Space permits only brief observations here.

The state has made several changes in the last two decades in the state-local sales tax picture that have complicated operation and, in some major instances, cost substantial revenue. First, the exemption of nonprescription drugs and medicines was a serious

error, as the experience of other states had long demonstrated. Exemption of these items greatly complicated compliance and administration, while the expenditures on them represent only a small element in family budgets.

Secondly, the variations in the bases of the local sales taxes, particularly those arising from state law that allows them to tax food and farm and industrial machinery when the state does not tax these items, causes major unnecessary complications. The problem of the local taxes has been greatly aggravated by the action of home rule cities in imposing their own locally administered sales taxes on top of the state-administered local sales taxes. This was a colossal error that should never have been permitted by the state. Differences in local sales tax rates, while a source of nuisance, are tolerable and may be regarded as essential, but differences in coverage are not. The long-standing lack of local use taxes except on motor vehicles has cost revenue and causes possible distortions in buying patterns.

Beyond these obvious mistakes, serious questions can be raised about the exemption of food from the state levy, although politically, reversal is unlikely (though Washington state did so in 1982). The objective of food exemption, highly desirable by usual standards of equity, was to remove the tax burden from the lowest income groups. But in doing so, food expenditures of all families were unnecessarily removed from the coverage of the tax. If the principle of taxing consumption is accepted, there is no justification for exempting all food, when other, simpler and less costly methods are available to remove the sales tax burden from the poor, namely a system of credits against state income tax, refundable when the amount exceeds the family's state income tax liability.

Conclusions on Services and Recommendations for Change

The proposal to extend the Illinois sales tax to services had merit in terms of the principle of sales taxation although it proposed inclusion of many business services. The most important rule is that tax should be confined, so far as possible, to those services rendered primarily to individual households, and not applied to services rendered primarily to business firms. Thus a more logical list would be comparable to that of Iowa, in terms of major categories, as follows:

Hotel and motel service, preferably to be brought under the sales tax rather than taxed by a separate levy; repair, cleaning, storage, and rental of all taxable tangible personal property, including all work on motor vehicles, taxable or not, and parking; repair and maintenance of real property, including such activities as interior decorating, pest control, security systems, lawn and garden care, well drilling, excavating, house moving; personal services, including beauty and barber shop work, massage, tanning and reducing salons, dance schools, dog training and grooming, flying schools, detective services, telephone answering; admissions and all commercial recreation, including golf and country club dues and charges, camp grounds; photographic work; employment agencies; and cable TV charges.

While some services to business firms would be taxed, most of the burden would rest on consumer services. These services should increase the sales tax revenue by as much as 10 percent. On the basis of the Iowa experience, most of the revenue would be yielded by beauty shops and barber shops, auto repair and services and other repair work, and admissions. To apply the tax to all services would risk the same strong adverse reaction as is occurring in Florida and injure the business climate of the state.

To meet other problems with the sales tax, several changes are urgently required, basically along the lines of the Whitley Committee report: (1) make nonprescription drugs and medicines taxable; (2) require uniformity of base of the local and state sales taxes, including those of the home rule cities (the home rule cities would be allowed to use higher rates; (3) require state administration of all local sales taxes, including those of the home rule cities. Another option would be possible increase in the state sales tax and use tax rate to 6.25 percent, with allocation of the sales tax portion on a point-of-sale basis, 1 percent to the municipalities, .25 percent to the county, with distribution of the additional state use tax by the state to the local governments. Local sales and use taxes would end, except that the home rule cities could levy up to 1 percent tax rates, the tax to be state collected.

These changes would solve the local-use-tax problem and tremendously simplify the operation of the taxes. These basic reforms, other than taxing services, would not significantly increase revenue, unless food were made taxable. But they would greatly simplify operation of the taxes. In the process, redrafting of the cumbersome and obsolete legislation would avoid confusion.

This article has not sought to consider the basic issue: should additional tax revenue be gained from extending the base of the sales tax or by an increase in the state income tax? The latter approach would be far simpler in terms of compliance and administration and usual standard of equity and can be justified on the basis that the Illinois income tax is one of the lowest in the country. The apparent shift by the governor in emphasis from broad taxation of services to this approach in mid-May has substantial merit.

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RONALD KRUMM AND NANCY MILLER

Household Savings and Homeownership

T he choice of homeownership involves the investment of an often substantial portion of a household's accumulated savings in their residence. It is therefore likely that the decision to become a homeowner or maintain ownership carries with it a change in a household's pattern of saving. This study examines the relationship between a household's pattern of savings and the homeownership decision. The issues addressed include the extent to which savings accumulation may be altered prior to the attainment of ownership (in an effort, for example, to build up a sufficient home equity down payment) and whether or not there is a long-term effect of homeownership on the level and composition of savings. We also examine the extent to which increased home equity, associated with housing price appreciation, is transferred into nonhousing savings in order to achieve a more balanced investment portfolio.

Issues

For many households it is likely that the desired timing of a home purchase does not coincide with that at which normal household savings would be sufficient to meet the required home equity down payment. In the absence of any changes in savings accumulation, the choice would be either to postpone the home purchase or to purchase a less expensive home that would provide fewer amenities. In order to reduce the loss of homeownership and/or housing consumption benefits, an alternative response would be to increase savings in earlier years. To the extent that this occurs, the savings accumulation of households renting their residences but planning for ownership in the future will exceed the savings of similar households not intending to invest in housing.

Another factor influencing the differences in savings accumulation for purposes of homeownership is that investment of a substantial portion of savings in home equity is likely to restrict severely the liquidity of the household's investment portfolio. In order to reduce the risk of having to liquidate the housing equity in response to future income shortages or expenditure needs, a household may indeed, by the time of the home purchase, accumulate savings beyond the amount needed to cover the desired equity down payment. This

response would increase differences in savings accumulation between renters who are and who are not intending to purchase a home.

The increased savings accumulation up to the time of a home purchase is different from the optimal pattern that would occur in the absence of tenure-choice considerations. Once the home is purchased, one alternative would then be to return to the optimal savings pattern by reducing the savings rate thereafter. In this case, the decline in the rate of savings accumulation shortly after the initial home purchase would occur and in the long run would wipe out any differences in savings accumulation between renters and owners. As mentioned above, however, investment of a substantial portion of a household's savings portfolio in owner-occupied housing is likely to alter the liquidity of the investment portfolio dramatically. This could lead to a desired increase in the level of nonhousing savings as well in order to cover unanticipated contingencies that might occur during the desired span of homeownership. While it is clear that at least the equity portion of the home investment is required by the time of the purchase, it may very well be that accumulation of the associated level of precautionary savings may be extended into the period of homeownership itself. Under such circumstances, the level of nonhousing savings after homeownership would again be built up to serve as a precautionary reserve. The result would be an increase in total desired savings of the households throughout the duration of homeownership.

Any long-lasting effects of homeownership on the level of household savings may be examined by evaluating savings patterns of households that switch from homeownership to renting. A normal relationship between savings accumulation, income, and consumption patterns might indeed lead to the case where the decision to liquidate housing equity is based on the desire to use accumulated home equity to support consumption in the retirement years. Unfortunately, the data used in this analysis are not rich enough to evaluate such patterns fully. However, they do allow for analysis of households that switch from homeownership during earlier periods in the life cycle. This decision might be made for reasons having nothing to do with savings accumulation, in which case the longer term effects of homeownership on total life savings could be examined. However, it is also possible that the decision to liquidate the investment in owner-occupied housing depends on financial considerations whereby the accumulated savings in the form of housing equity is required to meet divergences in consumption and/or earnings not sufficiently covered by accumulated nonhousing savings. Under such circumstances partial depletion of total savings after the switch in tenure status could be expected at least in the short run. The extent to which this is the dominant factor involved can be assessed by examining the difference between the increase in nonhousing savings after the tenure status change compared with that which would be implied by the transfer of all of the home equity into nonhousing savings.

Empirical Findings

The empirical analysis is based on a sample of approximately 4,000 households included in the University of Michigan Panel Survey of Income Dynamics. These data provide information on each of the households for each of the years from 1970 through 1979. The focus of this empirical study is on how previous tenure patterns affect nonhousing savings as of 1977, as well as how future (1978 and 1979) tenure choices affect nonhousing savings accumulation at the earlier (1977) date. Before turning to the results of that analysis, we examine the relationship between housing appreciation over time and the corresponding patterns of home equity to shed light on the extent to which increases are reflected in equity.

Retention of Housing Price Appreciation Gains in Home Equity

The table shows the housing values for the 2,106 households owning their residences continually from at least 1970 through 1977. For these households the average home value increased from $18,759 in 1970 to $37,606 by 1977. If these households did not participate in the housing market over this period, the 85 percent increase in house values reflects the extent of nominal house price appreciation over the period and corresponds to a 26 percent increase in real terms (above the increase in overall price levels during this period). To the extent that some of the households chose to upgrade their housing either by making improvements or by moving to a new home, this increase in housing prices provides an upper bound on the actual rate of housing appreciation.

Average Housing Values for Continuous Owners

	Home Value	Remaining Mortgage Principal	Mortgage Payment
1977	$37,606	$6,554	$1,071
1976	30,727	6,713	868
1975	28,492		
1974	25,882		
1973	23,570		
1972	21,185	6,252	956
1971	19,768	6,102	747
1970	18,759	6,220	725

The remaining mortgage principal increased only 5.4 percent, however, from $6,220 in 1970 to only $6,554 in 1977. At the same time, home equity increased 123.7 percent from $12,539 in 1970 to $28,052 in 1977. Thus, of the $18,847 average increase in home values over the period, $15,513 or 82 percent was retained in home equity. This amount provides an upper bound on transfers out of equity into, for example, nonhousing savings instruments or for consumption purposes. Some households will upgrade the residence, which likely involves additional transfers to equity from nonhousing savings. A question that remains unanswered, however, is whether the implied transfers of housing appreciation gains out of home equity would have been greater if it were not for the inhibiting costs associated with refinancing mortgages.

The nature of the findings presented in the table also holds as well for households beginning ownership only after 1970 and maintaining that status at least through 1977 (377 households of the sample). Although the average home price was lower for these households than those considered in the table, average housing price appreciation was similar in magnitude regardless of the starting date of homeownership. A striking difference between the results in the table and those for households starting homeownership after 1970 is that the average remaining mortgage principal for the latter is substantially larger both in absolute terms and relative to the home value. This is most likely due to the fact that many of the households included in the table had owned for a considerable amount of time before 1970. In results similar to those in the table, however, for the most part home equity increases associated with housing price appreciation were maintained as home equity regardless of the starting date of the initial home purchase.

A quite different picture emerges for households that shifted from ownership to rental status between 1970 and 1977. While only 198 households made such a change, housing appreciation rates for the vast majority were substantially less than for the households considered earlier. This was especially true for the years just prior to the change from homeownership. Moreover, of the increases in housing values over the homeownership period only 41.2 percent was retained as home equity by the time of the house sale, while average yearly mortgage payments increased over time as compared with those of continual homeowners. This suggests that there was either substantial refinancing of mortgages at higher interest rates or increased housing transactions for households in this group involving relatively lower equity investments. These results suggest an intimate tie between the financial side of homeownership and the decision to switch from that status.

Savings in Nonhousing Instruments

The home equity and home value patterns evaluated provide insights into the relationship between homeownership decisions and the home equity portion of a household's investment portfolio. The other portion is that invested in nonhousing instruments. The approach taken to determine the effects of homeownership decisions on patterns of nonhousing savings was first to control for the influence of the many other demographic characteristics on savings accumulation over the life-cycle. Having controlled for those effects that would alter nonhousing savings among households in the absence of the homeownership decision, the relationship between alternative tenure choice patterns from 1970 through 1979 and savings in nonhousing savings instruments as of 1977 was estimated.

Holding all other factors the same, and, for illustrative purposes, presuming a 6 percent rate of interest in 1977 on investments in nonhousing savings instruments, the difference in the level of savings in nonhousing instruments in 1977 by households that were homeowners at least since 1970 and that continued to be so at least through 1977 and households

that were renters over the same period is estimated to be about $16,000. As indicated in the previous section, on average only as much as $3,300 of this difference may be attributed to the transfer of past housing appreciation into nonhousing savings instruments. Thus, in addition to the value of home equity this finding suggests that continual homeownership is also associated with a higher level of nonhousing savings compared to households that continually rent their residence. Any inferences from this result must be qualified, however, in that many unobserved conditions facing households that restrict them from being able to accumulate savings (for example, unanticipated, extraordinary expenditure required by a chronic illness in the family) may very well also restrict their ability to have been homeowners.

Given that many of the households considered were homeowners for an unobserved length of time prior to 1970, perhaps a more appropriate comparison of nonhousing savings levels would be between households that became homeowners only between 1971 and 1976 and continual renters over the entire period. For households becoming homeowners in 1971 and continuing as such through 1977 compared with continual renters, the findings indicate that the difference in nonhousing savings in 1977 was only about $5,300. Even if $3,300 of this was due to a transfer out of home equity (from housing appreciation) there still remains a net higher level of accumulated nonhousing savings and, in conjunction with their home equity levels, a higher level of total accumulated savings. Indeed, a similar result is found for households that started homeownership in 1972, although the differential is slightly less. As might be expected, however, for households that started homeownership only by 1976, the level of nonhousing savings is estimated to be less than that of continual renters by about $4,900. The overall results suggest that the levels of savings accumulated in both nonhousing savings instruments and in home equity are positively related to the duration of homeownership, at least for the period considered here.

Effects of past homeownership on savings of households that switched from homeownership to renting are determined by examining savings in nonhousing instruments for such individuals in 1977 relative to households that never owned over the entire sample period. Renters as of 1977 who last owned in 1970 are predicted to have about $3,743 more in savings than comparable households who did not experience homeownership at least through 1977. This amount corresponds on average to only 59 percent of the equity in housing they had in 1970, suggesting a substantial depletion of the home equity for consumption in the intervening years. For households last owning in either 1971 or 1972, the savings differential is estimated to be $2,693 and $1,717, respectively. On the other hand, for those households having last owned their residence in 1976, the savings differential in 1977 is estimated to be $9,020, which is only 60 percent of the average 1976 home equity for the same individuals.

The above findings suggest that while households that did experience homeownership in the past had, on average, higher levels of nonhousing savings than did households that had continually rented, the implied level of nonhousing savings in years after the switch to rental status was considerably less than the level of home equity in the last year of homeownership. These results suggest a liquidation of home equity for purposes of meeting needed expenditures; perhaps those that led to the sale of the home to begin with. However, the results also suggest that there is a tendency for a further build-up of nonhousing savings thereafter.

Finally, we examine the effects of nonhousing savings accumulation in periods prior to the switch from rental to homeownership. For households renting through 1977 but choosing to become homeowners in 1978, the estimated value of accumulated nonhousing savings in 1977 was greater than that of continual renters by about one-half the value of initial home equity chosen in 1978. The funds required to meet the other half of the down payment presumably comes from depletion of other nonhousing savings accumulated up through 1977 or increased savings out of income between 1977 and 1978. For households renting through 1978 and choosing homeownership only by 1979, nonhousing savings accumulated by 1977 relative to continual renters is predicted to increase by about 36 percent of the initial home equity down payment made two years later. These results suggest that a substantial portion of the home equity down payment for first-time homeowners is accumulated in years prior to the change in tenure status above that which would normally be accumulated. The rapidity of this accumulation in years prior to the attainment of homeownership appears neither gradual nor sharp. For example, using the earlier example of a $15,000 home equity down payment in either 1978 or 1979, $5,425 of the $7,520 in additional savings accumulated through one year prior to the time of the housing investment would already have been accumulated by two years before the tenure change. This amounts to a difference of slightly over $2,000 accumulated in the intervening year (about 30 percent of the total). This illustration suggests that the extent of savings increase for the purpose of homeownership is likely to be highest in periods close to the time of the home purchase but that there is a substantial accumulation for the same purpose in earlier years. An additional implication of the findings is that the time difference between the decision to become a homeowner and the actual purchase is not likely to be trivial, especially given the impact of such a decision on the need for savings accumulation for the home equity down payment.

Concluding Remarks

The analysis presented here has focused on the implications of alternative tenure choice patterns for the structure of household savings accumulation. The results often indicate substantial alterations in the patterns of household savings accumulation as a result

of the decision to invest in owner-occupied housing. The empirical findings yield information about the savings patterns of different sets of households involved at various stages of the homeownership process. The results indicate patterns of increased savings accumulation in periods prior to the attainment of homeownership above that which would normally occur. The estimates suggest that this may account for as much as one-half of the initial home equity amount. At the time of the home purchase, nonhousing savings are drawn upon substantially in order to meet the equity down payment but soon after the level of nonhousing savings is again increased. Thus, having speeded up savings accumulation in order to attain homeownership, the new homeowners do not afterwards adjust the total level of savings in the direction of becoming the same as that which would have been made had they not chosen to own their own homes. In fact, even though housing appreciation for homeowners leads to future increases in total savings, our results indicate that the level of nonhousing savings are also increased compared with households choosing rental status. The findings for households that were homeowners for at least all of 1970 to 1977 indeed suggest that the build up of nonhousing savings may be substantial. Whether or not preferential tax treatment of owner-occupied housing is responsible for this build-up or whether it is due to other savings portfolio considerations is not addressed, however. Finally, the decision to change away from homeownership is found to be intimately tied to a depletion of the resulting home equity in years prior to as well as at the time of the home sale. A likely explanation of this finding is that unanticipated needs or income shortages lead to the decision to liquidate the home equity portion of household savings.

DAVID F. LINOWES

Is the Merger Mania Good for the Nation?

Mergers and acquisitions have become of major concern in Washington and on Wall Street in recent months, and this concern goes beyond the investigations of illegal insider trading. Increasingly, voices are being raised charging that the accumulations of tremendous pools of stock of major corporations by manipulators, bankers, and others are having adverse effects on our economy, and both Congress and the executive branch seem to be racing to design restrictive regulations or legislation.

Last year there were 15 mergers per working day, totalling over 3,000. Twenty-four of those mergers were for over $1 billion each, totalling over $200 billion. Since those employed by the 100 largest mergers alone supported families of 20 million people, obviously the stakes are high.

Mergers and acquisitions are not new; they have been taking place since the 1890s. Then, it was largely the merging of railroads, especially the smaller, weaker lines, in order to create major stable networks. That was followed by major merger movements in the 1920s and 1960s. John D. Rockefeller in his acquisitions of various oil properties was on a merger binge much of his life in building Standard Oil; J. P. Morgan, when putting together US Steel, made many acquisitions. The present day General Motors is an accumulation of Chevrolet Corporation, Buick, Oldsmobile, Cadillac, and others.

Parallel with 1920s

It is not difficult to draw a parallel between some of today's developments and some of those of the 1920s that led to the Great Depression of the 1930s and the creation of the Securities and Exchange Commission. In the 1920s stock manipulators quietly acquired large blocks of stock in a company then stimulated buying by the general public through false rumors and fictitious trading so that the price of the stock ran up. Finally, on the sly they would dump their holdings onto the public at highly inflated prices.

The basic technique, common then and now, involves the manipulation and accumulation of a massive block of stock in a target company and then cashing in at substantially higher prices. Although the old practices of creating phony trading transactions and the spreading of false rumors are illegal today, the same effect can be created by letting it be known that a target company is "in play." They do this by announcing their interest in a company after they have quietly acquired a large block of stock. As a matter of fact, the SEC requires such public notice when a 5 percent stake in a company is acquired.

Causes of Merger Movements

Merger movements are stimulated when one or more of three basic conditions exist: when there are major technological breakthroughs; when turbulent economic conditions result in depressed stock prices; or when new disruptive international developments arise.

All three of these elements have converged in recent years. Technologically, computer, and communications breakthroughs are revolutionizing economic and organizational relationships; production processes are going through dramatic changes; robots are replacing people; smokestack industries are giving way to service industries.

On the economic front, stock prices have been so depressed relative to the values represented that it is cheaper to take over an entire going business than to build new plants and break into new markets. Much of this was caused by the fact that stock prices had not caught up to the high inflation rates of the past.

Dramatic international developments have been caused by the explosion of Japanese and West German industries, seizing important segments of our automobile, steel, and electronics markets.

In addition to these triggering phenomena, other factors have contributed in important ways.

High Professional Fees

Of unusual significance are the enormous fees paid to bankers, lawyers, and accountants in mergers. For example, in one law firm in New York specializing in mergers, every partner earned $880,000 last year.

On the cover of the 24 November 1986 issue of *Fortune Magazine*, was a picture of a young man from the Midwest named David Wittig, born in Kansas, educated at the University of Kansas. At 31, he earns $500,000 a year working for Kidder-Peabody. His 18 merger deals since joining the firm brought in over $10 million in fees. And, Wittig's earnings are not a rarity on Wall Street. Students out of college with no experience are paid $100,000 per year.

When questioned about the outlandish earnings of young people, a chief executive officer in another Wall Street firm, Frederick H. Joseph of Drexel-Burnham Company said, "in an environment of phenomenal profits and unprecedented fees, what difference does it make. The difference amounts to a rounding error." David Stockman, with no background on Wall Street,

is reputed to have begun his career at a minimum of $1 million a year.

What do investment bankers do to earn these kinds of fees? They birddog potential targets and acquirers, then layout and help execute scenarios for bringing the two corporations together, including financing the package. Most investment banking firms today have in their computers extensive analyses of most public corporations to assist in these operations. Obviously, they get paid well for this service.

For example, in the Revlon takeover, valued at $1.83 billion, investment bankers received over $100 million in fees. Drexel-Burnham Lambert, Inc., alone received $60 million; Morgan Stanley & Co., about $30 million. It should be born in mind that some of these merger projects can take as little as six or even three months.

Changed Banking Practices

New fierce competition and loosening of government regulations have brought many changes in investment banking and in commercial banking practices and techniques. Examples are the use of "junk bonds," "leveraged buyouts," and "arbitragers." These are not new, but their widespread use *is* new. Some of these techniques have been used by the Pritzker family in Chicago for three generations.

The "junk bond" is a bond with a high rate of return, but carrying a low credit rating, generally BBB or lower. In 1986, about $35 billion worth of junk bonds were issued ($15 billion by Drexel-Burnham Lambert alone); presently over $1/4 trillion in junk bonds are outstanding. Paul Volcker, Chairman of the Federal Reserve Board, has spoken out strongly against them, as has Harold Williams, former Chairman of the SEC; but, from the investor's viewpoint, they are no riskier than the common stock of the same corporation. From the corporation's perspective, however, they do create burdensome obligations for high fixed costs.

Leveraged buyouts occur when the assets of an acquired company are used to take over the target corporation itself. This can be accomplished either by putting the assets up as security for a loan to finance the transaction or arranging in advance to sell a division of the target corporation immediately upon the completion of the transaction.

Arbitragers (Arbs) have come to play a critical role in the merger game. The basic original concept of arbitrage is that if stock is selling at a lower price in one market, say London, than in another, for example, New York, the arbitrager buys the stock in London and sells it in New York.

In the same manner, if someone announces that he will offer $65 a share at a certain date for a stock and it is now selling for $60, the arb will buy it at $60 and wait for that date to arrive to sell it, gambling that the transaction will be consummated.

The now-discredited Ivan Boesky had acquired considerable wealth as an arbitrager and a unique reputation for the uncanny ability to predict a merger, this, of course, before his exposure for trading on insider information. Before his fall, Boesky claimed to have had

an arbitrage fund of $2 billion. T. Boone Pickens is known to have an equivalent-sized fund.

Arbitragers have so extended their tentacles that they are redefining how to accomplish a takeover. A potential raider now simply solicits the Arbs and buys their blocks of stock in his target company, thereby side-stepping SEC regulations. This is how a Canadian real estate company, Campeau, took over Allied Stores, which owns such well-known retailers as Brooks Brothers and Ann Taylor.

Beatrice Foods in Chicago was taken over by a Wall Street investment banking firm in the same manner. Arbs owned 80 percent of the stock and sold it to Kohlberg, Kravis, Roberts and Company. The acquirer then proceeded to dissect the company.

Mergers' "Newspeak"

All this razzle-dazzle in Wall Street has given birth to a merger "newspeak." The term, "raider," is self-descriptive: He is the principal player who leads the charge into what is generally unfriendly territory. That is how T. Boone Pickens captured Mesa Petroleum and Carl Icahn took over TWA.

No entrenched executive is going to look kindly at such an attempt to take over his company. After a certain amount of huffing and puffing, he may discretely send an emissary to try to buy the raider off. In "greenmail" the raider is paid a price by the company higher than the then current market for the stock. Last year there were about 50 such greenmail transactions. Saul Steinberg was bought off from raiding Walt Disney with greenmail. And thereby incumbent officers continued to hold onto their jobs.

If the raider cannot be dissuaded by greenmail, then management may try "shark repellents." These involve such tactics as staggering the terms of the members of the board of directors or the issuance of stock with disproportionate voting rights.

Or, it takes a "poison pill" such as selling off a highly desirable division or incurring huge debts. Phillips Petroleum took a poison pill to fend off T. Boone Pickens in his attack by incurring debts totaling $4.5 billion. Now, however, analysts wonder whether the tactic may prove poisonous to Phillips itself and, therefore, threaten its solvency.

When a management begins to feel that all is lost, it may decide to relax and enjoy it by use of "golden parachutes": incumbent executives enter into contracts with their corporation in which the corporation agrees to make large severance payments to the executives in event of a takeover and the loss of their jobs. Sometimes the amounts are quite startling. In the Revlon takeover, it is reputed that the golden parachute for the chief executive officer alone was about $20 million.

When a takeover by an unfriendly raider appears inevitable, the incumbent management might peddle the company to a friendly corporation. This friendly takeover corporation is called a "White Knight."

Instead of a White Knight, management may bring in a "White Squire." A White Squire is a friendly investor who agrees to buy a large block of the target company's stock, thereby insulating it from the hostile attack. Not infrequently this tactic backfires, and the White Squire seizes the company for himself, removing the same executives who invited him in.

Pros and Cons

All of this activity obviously stirs up strong reactions. Andrew C. Sigler who is President of the Business Roundtable, an organization made up of chief executives of 200 major corporations charges,

"It is nothing but a grubby asset play. They are acquiring the greatest accumulation of wealth of all time—greater than the Rockefellers or the Rothschilds—they are doing it by snapping it out of companies, thus damaging the capability of the economic system to perform."

In response, T. Boone Pickens, self-appointed spokesperson for aggressive corporate acquirers, observed,

"The only real stake that many managers have is their job. The 200 members of Business Roundtable own less than three-tenths of one percent of their companies. *Fortune's* survey of May 1986 showed that 9 percent of Fortune 500 CEO's own no stock in their companies. No wonder they think like bureaucrats instead of like entrepreneurs."

Mergers have always had important effects on companies, their employees, and the communities in which they are located. In recent years the impact has been much broader, deeper, and immensely more significant than in the past, largely because corporations themselves have changed. Although they are called by the same name, corporations have taken on a dramatically different concept. They are now quasi-public institutions with social responsibilities along with profit responsibilities. They carry many of the rights and responsibilities of citizenship, and they have become so large and powerful that corporations often have more significant impact on the lives of more people than many political jurisdictions.

Arguments against Mergers

There are a number of justified arguments against this feverish activity. When a merger results in closing or moving plants or offices, it may disrupt a community, adversely affecting employees and officers. Sometimes a new parent company may siphon off excess cash, making the acquired company more vulnerable to economic downturns. Management that spend much of their attention in acquiring other companies may overemphasize keeping the current price of the stock high, leading to a concentration on short-term profits, or to what is delicately called "imaginative accounting," which could result in misleading financial reporting. And when large debts are incurred to effect the merger, the cost of carrying

that debt could be devastating.

Sometimes a takeover is accomplished through a leveraged buy out by its own officers. This action strikes me as inherently wrong. Officers have a fiduciary responsibility to the stockholders of the company they manage. If they believe that by taking certain actions they can increase the value of a company's stock, then they have a moral (and perhaps legal) obligation to take such actions on behalf of all the stockholders.

Arguments Favoring Mergers

On the other hand, there are arguments favoring this merger activity. Aggressive mergers are the market's protection against mismanagement. An incumbent management that is not functioning effectively has no right to a first claim over corporate resources just because of incumbency. The assets belong to the shareholders.

A constructive merger transaction may reinvigorate drifting management and stimulate dormant resources. When a stronger company acquires a weaker or smaller company, new financing is made available, as are wider distribution facilities and new executive talent. Through a merger the deadening hand of nepotism can be removed.

International competition is a powerful force in today's business environment. Seventy percent of our products are competing with foreign manufactured products. In order to achieve the economies of scale so a company can be competitive, size is often critical.

Conclusion

What does all of this add up to? Obviously, no merger is neutral. I am convinced that discreet, thoughtful mergers are an important ingredient of our economy, keeping it stimulated and ever advancing. It is what a major figure in 20th century economic thought, Joseph Schumpeter, described almost a half century ago as "destructive capitalism." "Creative destruction," Schumpeter argued, "gives capitalism its vitality."

It is unmistakable that a constructive, well-planned merger strengthens a corporate unit and stimulates renewal, changing yesterday's inertia into fresh challenges today. I should caution that in evaluating a merger in today's climate, it is important to keep separate the process from the fact. Too often the press and the public do not keep them separate, nor do too many Congressmen.

Some steps in the process have been abused. Trading stock on the basis of insider information is not only illegal, but it distorts the constructive goal a well-intentioned merger seeks to accomplish. "Greenmail" cheats the public stockholders.

The role of arbitragers likewise frequently tends to so manipulate the merger process so as to cast an unsavory shadow on the function itself, leading to disruptive practices by both management and acquirer.

In short, it is apparent that the merger process has been abused, and regulation of that process, therefore, is justified and necessary. One approach might be to require a minimum holding period for stock—say six months—before it could be voted in an acquisition action.

I want to emphasize that in those situations where incumbent managements are doing well—both for the long term and short term—actions by uninvited raiders without any business purpose other than short-term personal gain could be harmful to the companies and our economy.

However, in those situations where managements have been lethargic and self-serving, there is justification for change and the implementation of a fresh approach through the merger route. Therefore, short of restraint of trade and unfair competition, I would not recommend regulatory restrictions on the merger function itself, as distinguished from the process. Free market forces should be allowed to have full play.

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Illinois Business Indexes

There is increased uncertainty regarding the economic outlook for Illinois. The composite leading indicator depicted in Chart 1 provides mixed signals. The three-month moving average of the indicator (MA 3) has declined, while the six-month moving average (MA 6) has risen. MA 3 has edged downward from 14.64 in January to 13.88 in March; MA 6 inched upward from 11.22 in January to 12.48 in March.

The decline in MA 3 does not necessarily indicate that the Illinois economy is headed for a downturn. Instead, it may represent a temporary variation in the overall upward trend of the series. Stronger evidence of an impending decline in the state's economy would be provided by these indicators if the three-month moving average were to fall below the six-month moving average and remain there for four consecutive months.

Inflation has accelerated in Chicago and in the North Central region as a whole. The charts illustrate the year-to-year percent change in the CPI for Chicago and for the North Central region. The percent change in the Chicago CPI of 3.58 percent for the year ending March 1987 represents the largest increase in the last two years (Chart 2).

For the North Central region as a whole (Chart 3), the year-to-year increase in prices averaged less than one percent for the one-year period ending April 1986 through the one-year period ending December 1986. However, as the chart shows, in February 1987, prices in the North Central region increased 1.77 percent over February 1986. The charts for the North Central region for various population sizes also depict a similar acceleration in inflation for the early months of this year (Charts 4, 5, 6). The CPI's for the coming months will provide an indication of whether this is a temporary increase or the beginning of an upward trend in inflation.

Illinois Business Indexes

	Percent Change Mar 1986-Mar 1987	March 1987	Feb 1987	Jan 1987	Dec 1986	March 1986	Feb 1986
Leading Indicator(MA3)	12.20[a]	13.88	14.45	14.64	11.10	1.68	−0.07
Leading Indicator(MA6)	11.77[a]	12.48	12.46	11.22	9.16	0.71	−0.11
Employment-manufacturing (in thousands)[b]	−0.46%	925.1	926.5	922.3	922.2	929.4	929.8
Average weekly hours-manufacturing[b]	0.98%	41.3	41.5	41.3	41.6	40.9	40.1
Weekly earnings-manufacturing[b]	3.26%	$447.69	$448.62	$444.80	$446.37	$433.54	$423.06
Help wanted advertising-Chicago (1969 = 100)[c]	20.21%	113	113	98	121	94	93
Help wanted advertising-St. Louis (1969 = 100)[c]	−2.86%	68	70	67	62	70	70
Retail Sales (in millions)[d]	1.79%	$5,224	$4,698	$4,637	$6,944	$5,132	$4,355
Coal production (in thousands of tons)	−6.20%	5,145	5,010	5,229	4,882	5,485	5,309
Petroleum products (in thousands of barrels)[b]	−20.26%	1,995	2,100	2,000	2,110	2,502	2,650
Vendor performance[e]	10.00%	55%	52%	55.0%	56.0%	50.0%	48.0%
Building permits (in thousands)							
Residential housing units	36.95%	4.170	2.521	2.259	2.971	3.045	1.573
Value of Residential housing	52.55%	$312,391	$192,823	$163,055	$205,774	$204,774	$111,698
Value of nonresidential construction							
Industrial buildings	22.80%	$26,564	$6,136	$12,776	$103,043	$21,632	$20,295
Office, banks, and professional buildings	339.26%	$36,002	$41,551	$61,793	$24,216	$8,196	$38,003
Stores and other mercantile buildings	−6.00%	$36,081	$25,312	$24,415	$20,906	$38,386	$17,452
Other	266.69%	$4,701	$6,037	$3,056	$2,865	$1,282	$1,693
Consumer price index (December 1977 = 100)							
North Central US[f]	1.77%	179.5	178.5	178.3	177.1	—	175.4
North Central population more than 1,200,000[f]	1.84%	183.2	182.5	182.1	181.0	—	179.2
North Central population 360,000 to 1,200,000[f]	2.01%	177.8	177.2	177.2	176.1	—	173.7
North Central population 50,000 to 360,000[f]	1.88%	175.3	173.6	173.9	171.9	—	170.4
North Central population less than 50,000[f]	1.29%	174.0	172.9	172.5	171.6	—	170.7
Chicago (1967 = 100)	3.58%	335.5	334.2	334.3	331.0	323.9	326.4
St. Louis (1967 = 100)	3.01%	328.8	—	326.7	—	319.2	—
		1986 IV	1986 III	1986 II	1986 I	1985.IV	1985.III
Personal income (in millions)[b,g,h]	4.03%	$180,153	$178,757	$179,622	$174,013	$173,178	$170,458
Per capita personal income[b,g,h]	3.41%	$15,513	$15,490	$15,029	$15,051	$15,001	$14,788

[a]Represents absolute change (percent change not relevant). [b]Recent month is preliminary figure. [c]The Conference Board, *Help Wanted Advertising*, March 1987. [d]Latest 3 months projected by BEBR [e]Percentage of companies receiving slower deliveries [f]Percent change between February 1986 and February 1987. [g]Seasonally adjusted at annual rates. [h]Percent change between 1985.IV and 1986 IV

Chart 1. Composite Leading Indicator (Average Percent Change in Base Indexes)
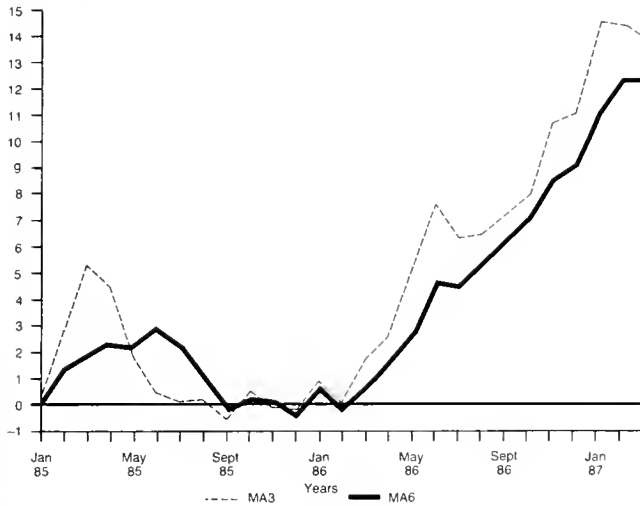

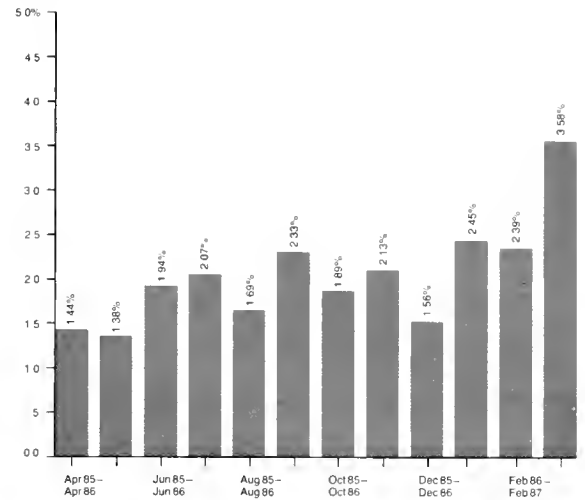**Chart 2. Year-to-Year Percent Change in Chicago CPI (1967 = 100)**

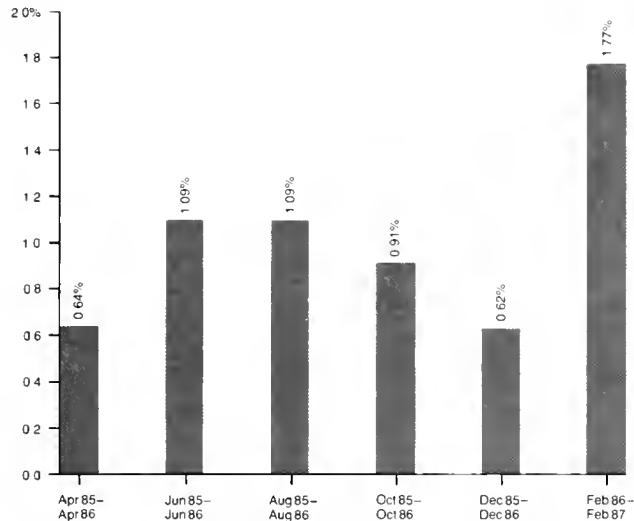**Chart 3. Year-to-Year Percent Change in North Central Region CPI (Dec. 1977 = 100)**

Chart 4. Year-to-Year Percent Change in North Central Region CPI—Population over 1,200,00 (Dec. 1977 = 100)
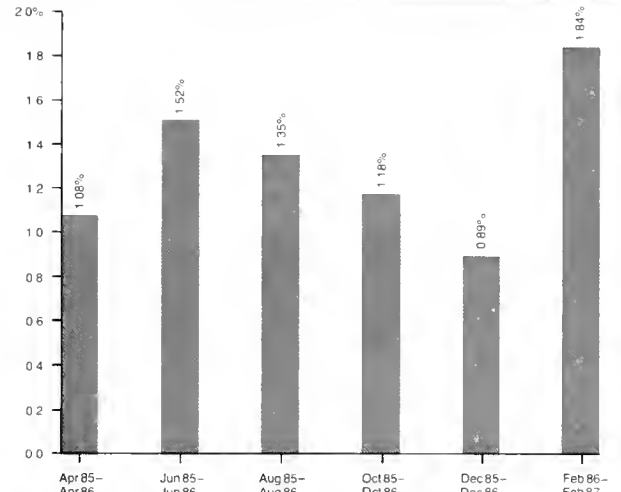

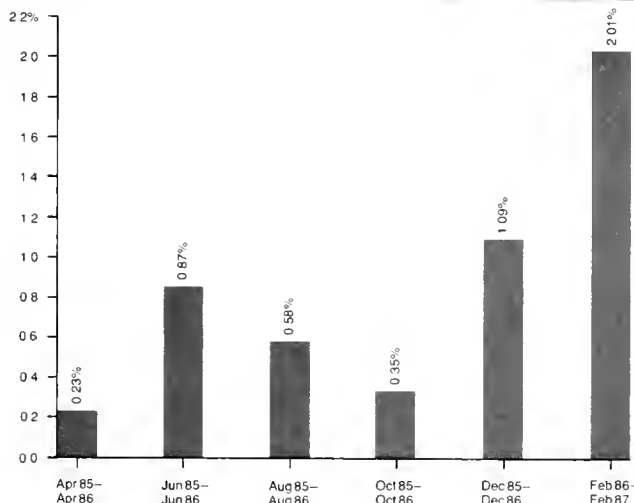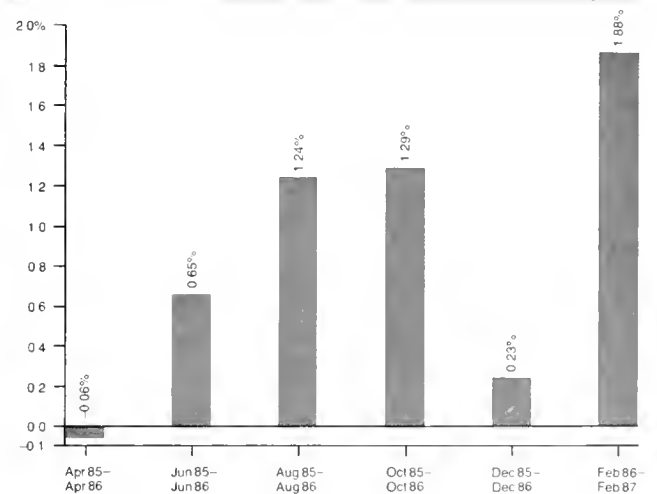**Chart 5. Year-to-Year Percent Change in North Central Region CPI—Population 360,000–1,200,000 (Dec. 1977 = 100)**

Chart 6. Year-to-Year Percent Change in North Central Region CPI—Population 50,000–360,000 (Dec. 1977 = 100)

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Illinois Business Review

Illinois Economic Outlook

Illinois Personal Income (Seasonally Adjusted)

	History				Forecast			
	86:II	86:III	86:IV	87:I	87:II	87:III	87:IV	88:I
Personal Income (in millions)	$179,662	$178,757	$180,153	$183,814	$184,764	$187,676	$191,154	$194,602
Mining	$1,181	$1,155	$1,130	$1,098	$1,071	$1,061	$1,060	$1,060
Construction	$7,832	$8,039	$8,083	$8,016	$7,819	$7,702	$7,636	$7,579
Manufacturing	$28,684	$28,871	$29,334	$29,705	$29,783	$30,039	$30,380	$30,524
Nondurable manufacturing	$10,756	$10,767	$11,081	$11,392	$11,528	$11,690	$11,852	$11,893
Durable manufacturing	$17,928	$18,104	$18,253	$18,313	$18,255	$18,349	$18,528	$18,631
Utilities and transportation	$10,169	$10,314	$10,312	$10,544	$10,572	$10,675	$10,791	$10,916
Wholesale and retail trade	$22,748	$23,085	$23,355	$23,799	$24,227	$24,657	$25,094	$25,523
Services	$30,295	$30,791	$31,256	$32,851	$33,286	$34,192	$35,144	$36,133
Finance, insurance and real estate	$11,562	$11,869	$12,196	$12,855	$12,833	$13,079	$13,339	$13,616

Bureau of Economic and Business Research

Illinois personal income for 1986 was $178 billion, an increase of 4.8 percent over 1985. After a slight dip in the third quarter of 1986, personal income rebounded and continued growing into early 1987. The Illinois Econometric Model forecasts that positive growth will continue through the beginning of 1988. The forecasted personal income growth rate for 1987 is 3.5 percent.

All nonfarm private sectors of the state economy except construction and mining are projected to experience positive growth through the first quarter of 1988 (see the table). Personal income from mining decreased 8.8 percent in 1986, and is forecasted to fall 4.5 percent in 1987. It is anticipated that wholesale and retail trade, along with services and finance, insurance and real estate will continue to grow faster than state personal income as a whole. Nondurable manufacturing is expected to show improvement through 1987, with a 5.4 percent annual growth rate.
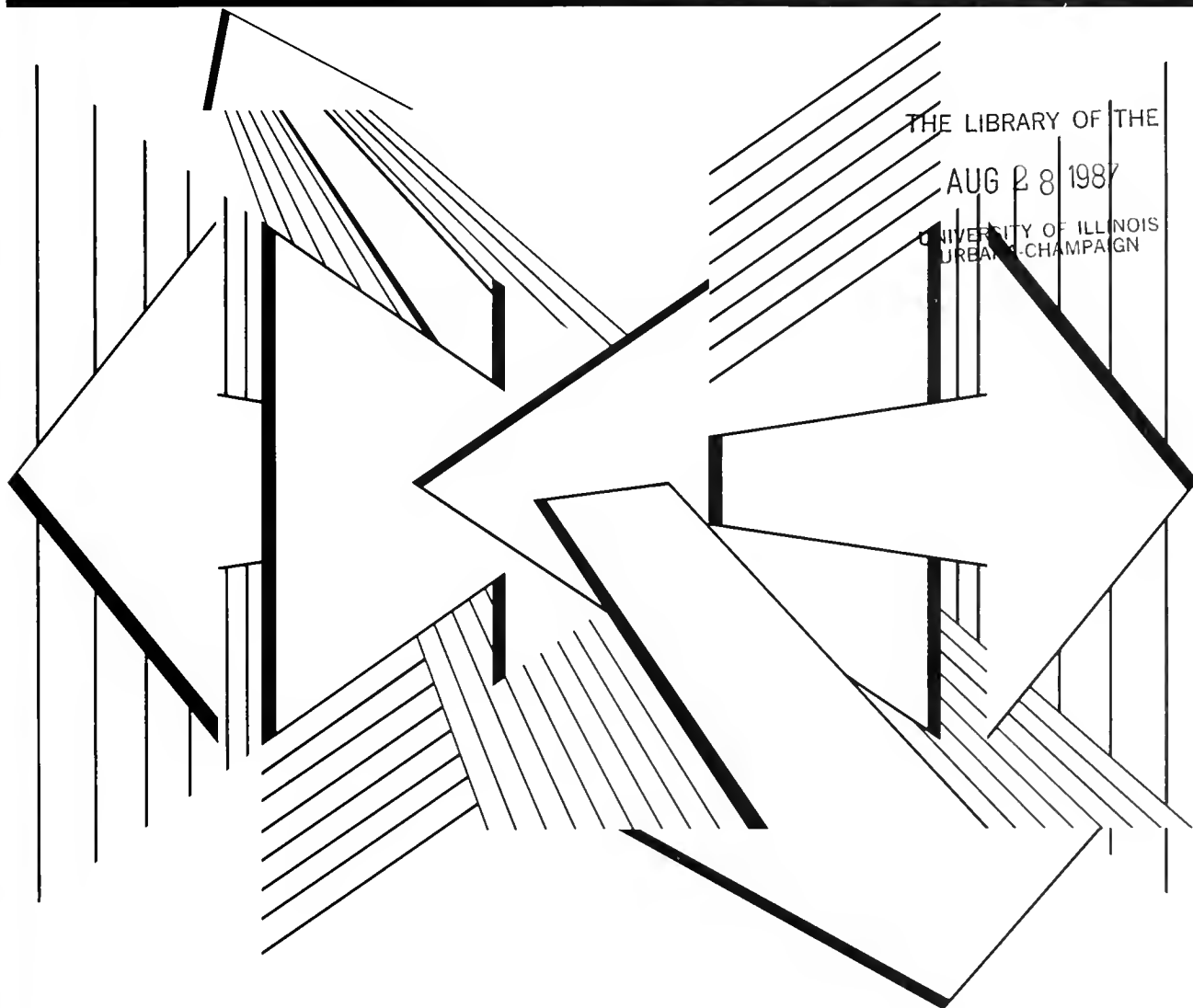
Illinois Personal Income (in billions of dollars)
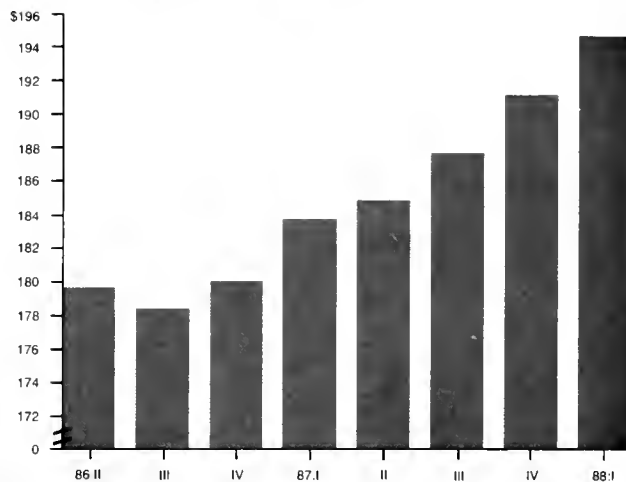
Illinois
Business
Bureau of Economic and Business Research
College of Commerce and Business Administration
University of Illinois at Urbana-Champaign
Review

WILLIAM R. BRYAN

The Federal Budget Turns Restrictive

Evidence presented here suggests that fiscal actions have moved toward restriction in recent years. This conclusion emerges from a review of federal fiscal developments during the period since 1980. An analysis of the period involves the consideration of two sets of contrasting forces, one expansive and the other restrictive. On the one hand, it is clear that the marginal net tax rate during the period from 1984 to early 1987 is markedly smaller than during the 1980–1983 period. This means that, given an expansion in income, recent and current increases in tax revenues net of income transfers are less than before. In this sense, fiscal actions are stimulative. But, on the other hand, in successive recent years there has been a tightening in the fiscal framework considered as a whole. Increases in balanced-budget GNP, a meaningful measure of the overall impact of fiscal actions, slowed markedly in 1985 and 1986.

The first part of this article is a brief review of traditional theory concerning the way federal fiscal actions affect the economy. Next, there is a summary of fiscal developments during the period from 1980 to 1986. Following this, there is a review of the changing configuration of the current account surpluses serving to offset the federal deficit. Finally, a set of conclusions is drawn.

Theory

Changes in the impact of fiscal policy may be judged by changes in the level of GNP at which the federal budget would be in balance. Rapid increases in balanced-budget GNP are conducive to increases in actual GNP. An expansion in balanced-budget GNP means that there is an increase in the federal deficit corresponding to any level of GNP. Thus, any net surplus (or deficit) position of the nonfederal sectors leads to a larger flow of GNP. Larger flows of GNP are brought about in the process by which the federal deficit (or surplus) is fitted to match the nonfederal sectors' surplus (or deficit). In contrast, sluggish increases or declines in balanced-budget GNP exert a restrictive force upon the economy.

Fiscal policy relates to taxing and spending initiatives of the federal government. Federal tax receipts result from a combination of two factors. One factor consists of the set of rules specifying the process by which households and economic units calculate their tax liabilities. Economists often summarize that set of rules in a tax function. The second factor is really a set of results, including aggregate income, or GNP. If both the tax function and aggregate income are known, total tax receipts can be calculated.

Presumably, the size and composition of federal expenditures are determined by national priorities or other political considerations. Such expenditures are unlikely to be strongly related to aggregate income in the short run. To the extent that there is a relation, it is probable that federal expenditures will decline as income increases, chiefly reflecting declines in unemployment compensation and other cyclically sensitive transfer payments.

The federal deficit/surplus function is created by subtracting the expenditures function from the revenues function. For illustrative purposes, that function is shown as S_g in Chart 1, and its scale is shown on the right. The horizontal scale is aggregate national income. As drawn, the federal budget moves toward surplus as aggregate income expands.

Chart 1. Federal and Nonfederal Budget Schedules
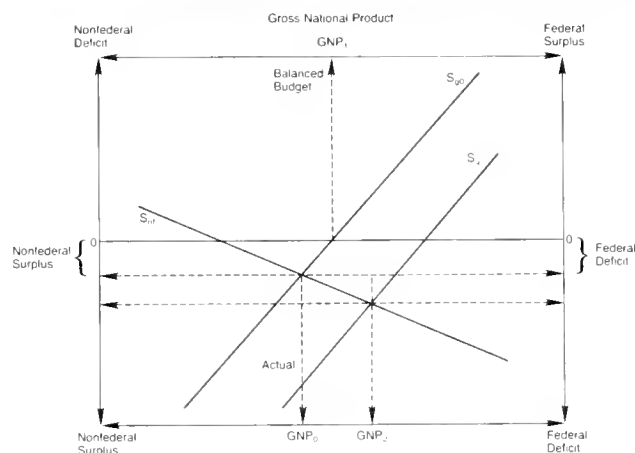
Similarly, it is possible to specify budget positions for the nonfederal sectors (households, state and local governments, and the foreign sector). Although no supporting evidence is presented, we offer the conjecture that the nonfederal budget also moves toward surplus as the economy expands. The nonfederal budget function is labeled S_{nf} in Chart 1.

Equilibrium income is determined at the point where the federal deficit/surplus function intersects the nonfederal budget function. In nonequilibrium positions, the gap between the functions is closed by unplanned inventory changes, so that at all times the federal deficit (or surplus) just equals the nonfederal sectors' surplus (or deficit). In Chart 1 the federal sector is in deficit and the nonfederal sectors are in offsetting surplus. Aggregate income is shown as GNP_0.

For the federal budget to be in balance, it would be necessary for aggregate income to reach GNP_1 (shown on the top axis). But for that to occur, it would be necessary for the nonfederal function to shift upward to the right (to the north-east). Factors that would contribute to such an upward shift include an expansion in consumption, a rise in investment, an

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increase in state or local government spending (alternatively a cut in state and local taxes), or an increase in net foreign investment (a decline in imports and/or a rise in exports). The combination of such factors implies a strongly expanding economy.

A shift or rotation of the S_g schedule to the right (to the south-east) may also be regarded as expansionary. Factors contributing to such a shift or rotation would include either increases in federal expenditures or transfers, tax reductions, or all three. Factors leading to movements in the S_g schedule also lead to changes in balanced-budget GNP. Expansive fiscal actions serve to expand balanced-budget GNP. Restrictive actions serve to reduce balanced-budget GNP.

Although specific fiscal policy shifts contribute in a predictable way to changes in the economy, actual GNP depends, as indicated, upon both the S_g and S_n schedules. Moreover, because there is a substantial overlap between the factors that determine the slope and position of the two schedules, it is unlikely for one schedule to change without introducing movement into the other.

The slope of the S_n schedule is a major determinant of the impact of fiscal actions. The slope shown in Chart 1 indicates that the aggregate of the nonfederal budget schedules moves toward surplus as income expands. As drawn, expansive fiscal actions (a shift from S_{g_1} to S_{g_2} in Chart 1) result in a rise in income to GNP_2 and a movement of the federal budget toward increased deficit (with a corresponding increase in the nonfederal surplus). In contrast, tax increases or expenditure cuts lead toward a reduction in income and a movement toward budget surplus.

In the example discussed earlier and illustrated in Chart 1 the concomitant shift in the nonfederal schedule from the change in the federal schedule was not shown. In fact, however, the movement in the nonfederal schedule tends to offset partially the effect of shifts in federal fiscal policy. Even so, the qualitative results shown in Chart 1 are not affected.

In short, even though it is useful to pay attention to shifts in balanced-budget GNP as an indication of the stimulative or restrictive thrust of fiscal actions, these shifts yield only limited predictive insights. For the federal budget schedule, S_g is only one blade of the scissors. The other blade consists of the nonfederal schedule, S_n. As indicated, the federal deficit (or surplus) and the associated level of aggregate income (GNP) are forged at the intersection of the federal and nonfederal budget schedules.

Developments during the 1980s

Rates of growth in balanced-budget GNP during the 1980s have been uneven. From 1980 to 1983 annual increases in balanced-budget GNP averaged 9.4 percent (see Chart 2). All of 1980 and 1981, as well as three-fourths of 1982, reflect the planning of the administration of President Carter. From 1983 to 1984 there was a 17.8 percent jump in balanced-budget GNP, an extremely expansive shift. Since that time, however, the growth in balanced-budget GNP has slowed markedly. Each of the past two years has registered a

tightening compared with its preceding year. Balanced-budget GNP rose only 2 percent from 1985 to 1986. It is in this sense that recent years have witnessed a progressive fiscal tightening.

Chart 2. Changes in Balanced-Budget GNP
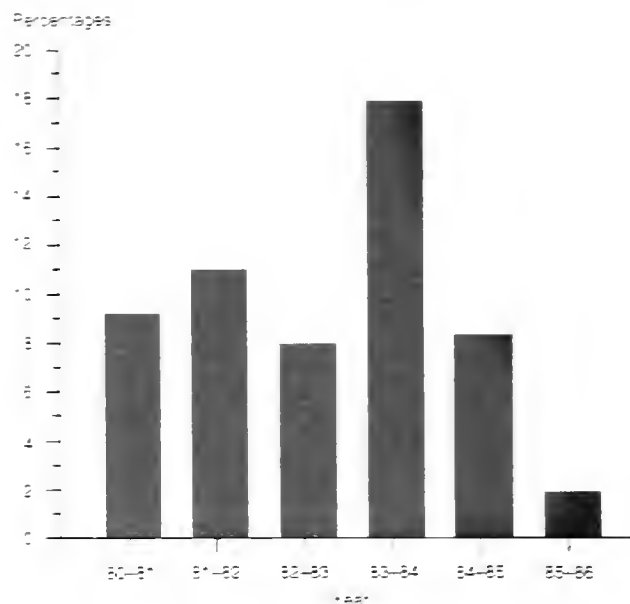
It is necessary to use words carefully in interpreting fiscal policy in the 1980s. Considered as a whole, it is clear that the fiscal setting in recent years is expansive compared with the setting during the 1980–1983 period. In that period, the estimated tax rate net of transfers averaged 0.332, indicating that 33.2 cents was taxed from incremental dollars. In the last three years (1984–1986) the average net tax rate has fallen, such that only 21.4 cents net of transfers is taxed from each dollar. In common parlance and with reference to these two time frames, fiscal policy has eased.

There is no ambiguity regarding what has happened to the size of the deficit in absolute dollar magnitudes. It has grown. In the 1980–1986 period there was a cumulative deficit of $1,019 billion (see the Table). In addition, the business sector incurred a cumulative deficit of $699.5 billion. The sum of these two deficits for the 1980–1986 period was $1,718.5 billion. The cumulative offsetting-sector surpluses were generated by households ($1,009.1 billion), state and local governments ($334.8 billion), the foreign sector ($360.5 billion), leaving a discrepancy of $14.1 billion.

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Sector Surpluses and Deficits, 1980–1986 (in billions of dollars)

| Nonfederal Budget Positions	1980	1981	1982	1983	1984	1985	1986	1980-1986
Households	136.9	159.4	153.9	130.6	168.7	143.3	116.3	1009.1
Businesses	−95.5	−124.4	−44.1	−40.7	−156.0	116.6	122.2	699.5
State and local governments	26.8	34.4	35.1	47.5	68.8	61.7	60.8	334.8
Foreign	−13.0	−10.6	1.0	33.5	90.7	115.2	143.7	360.5
Discrepancy	6.1	5.0	0.0	5.1	−1.9	−5.6	5.4	14.1
	61.3	63.8	145.9	176.0	170.0	198.0	204.0	1019.1
Federal budget position	−61.3	−63.8	−145.9	−176.0	−170.0	198.0	−204.0	−1019.0

Chart 3 shows only the federal budget schedules. The positions of P_1 through P_7, denoting actual GNP and actual federal deficits, suggest that the nonfederal schedules are likely to slope downward (as illustrated in Chart 1). In fact, however, their slopes and positions are not known, and there is every presumption that the schedules bounce around. There were substantial shifts in the behavior of the underlying sectors during the 1980–1986 period.

From 1980 to 1983, there were three chief factors accounting for the marked rise in the federal deficit. From 1980 to 1983 the federal deficit rose from $61.3 billion to $176 billion, increasing from 2.24 percent to 5.17 percent of GNP. The bulk of the rising federal deficit was reflected in a sharp decline in the net position of the business sector. Whereas the business sector incurred a $95.5 billion deficit (3.5 percent of GNP) in 1980, by 1983 its deficit was only $40.7 billion (1.20 percent of GNP). Another major portion of the rising federal deficit was accommodated by a marked shift in the funds position of the foreign sector. In 1980 foreigners were net borrowers of $13 billion, the mirror image of the US net export surplus. In 1983 foreigners were net lenders of $33.5 billion, a reflection of the US trade deficit.

Even though the absolute dollar magnitude of the federal deficit rose $28 billion from 1983 to 1986, it declined slightly relative to GNP. The increased dollar volume of the deficit was accounted for chiefly by a further shift in the foreign sector toward surplus on funds account (from just under 1 percent of GNP in 1983 to 3.41 percent of GNP in 1986).

Chart 3. Federal Budget Schedules, 1980–1986
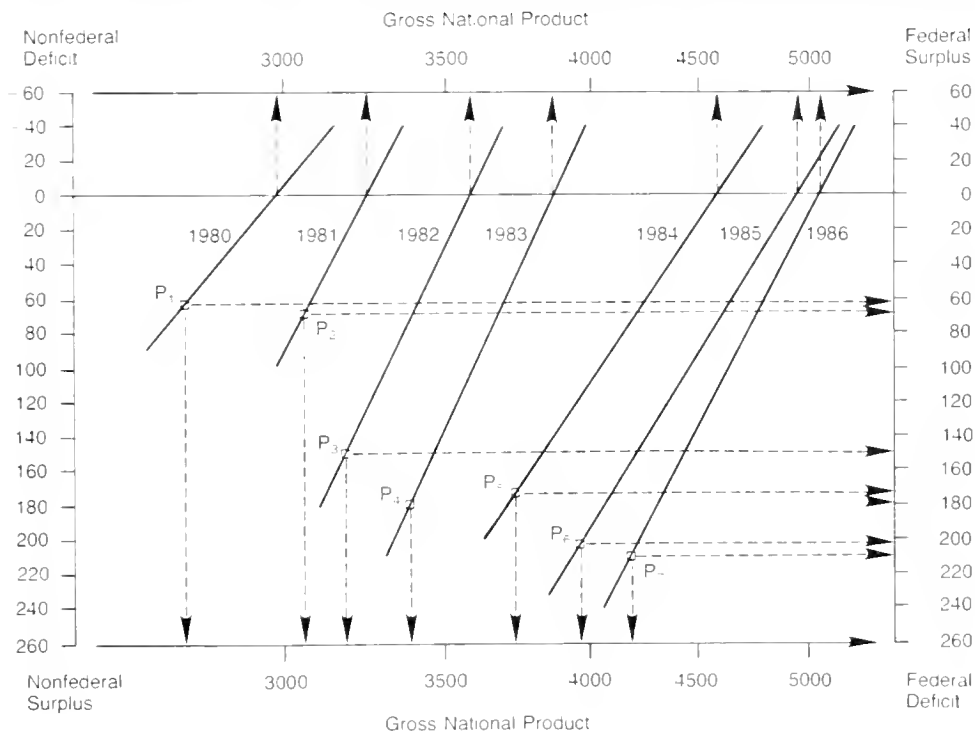
Desirable Fiscal Policy Developments

Federal expenditure and tax developments can be judged usefully in terms of the extent to which they contribute to the realization of public policy goals. Federal expenditures make claims on the use of real resources. The cost of committing resources to one use is that they are unavailable for alternative uses. Presumably, we want the set of federal expenditure programs that most faithfully reflects the political goals of the population.

Given the political decisions that define federal expenditures, what remains is to devise a tax structure that most contributes to economic or political objectives. The menu of alternative objectives, sometimes mutually exclusive, includes price level stability, high employment (low unemployment), budget balance, distributional equity, and so forth.

Over the past few years, the issue receiving most attention has been the federal deficit. There has been strong public interest in reducing the deficit. Even so, it is unlikely that the public would support a deficit-reducing policy that would involve a weakened economy and increased unemployment. Hence, it is important to evaluate fiscal policy measures in terms of their prospective impact on both the federal deficit and the economy. Two questions are of major importance: (1) Can a tax increase lead to a smaller federal deficit without adversely affecting the economy? (2) Can a tax cut lead both to an expansion in the economy and toward a smaller federal deficit?

A tax increase sufficient to overcome year-after-year trends in expenditures growth is likely to lead to increased revenues and a smaller federal deficit, but it is also likely to lead to a weakened economy. For a tax increase to lead both to a smaller federal deficit (or a surplus) and to an expanded economy, the nonfederal schedule, whatever its slope, must shift upward. To lead to an expansion in GNP, all or some combination of the following would need to occur. Households would need to increase their consumption; businesses would need to invest more; households and businesses would need to import less; and the business sector would need to export more.

On its face, there is superficial plausibility to the notion that such beneficial developments would result from a tax increase. It is popularly believed that an increase in federal taxes would contribute to interest rate declines, thereby stimulating investment and consumption spending. By an extension of that reasoning, it is possible to imagine that the nation's net export position would be improved. Even though these ideas are popularly held, there is essentially no evidence to support them.

A tax cut is likely to contribute to an expansion in income but to an enlarged federal deficit. A tax cut can lead to a smaller federal deficit under two conditions. One condition relates to the slope of the nonfederal schedule. If it is upward sloping, a tax cut can lead to a reduced federal deficit. The other condition relates to shifts in the nonfederal schedule, explainable on the basis of traditional doctrine. The Kennedy-Johnson tax cut in 1964 was based on a combination of such

traditional Keynesian notions. The Reagan tax cuts were based on a somewhat different set of beliefs (that is, so-called Supply-Side Economics). As it turns out, the Kennedy-Johnson tax cut was followed by a movement of the federal budget into surplus. The Reagan tax cuts have been followed by larger deficits.

Concluding Remarks

As stated in the outset, recent changes in balanced-budget GNP show some movement towards restriction. Even so, the marginal net tax rate continues to be substantially smaller than during the early 1980s. Whatever interpretation one may wish to make of our current fiscal stance, the growing shortfall from balanced-budget GNP provides evidence that the fiscal environment has become increasingly inappropriate.

Two points emerge from the foregoing analysis. First, it is clear that there is no fiscal action that can be counted on to achieve both high employment and an improved federal budget position. Second, it is clear that the impact of fiscal policy is critically dependent upon the shape of and potential movements in the nonfederal schedule, not the federal schedule. Whatever the shape of the federal schedule, what is needed are strong upward shifts in the nonfederal schedule. Within the present environment, there are two meaningful sources of such shifts. One is the business sector. What is needed is a strong expansion in business investment in plant and equipment. The second is the foreign sector. What is needed is a strong movement toward a net export surplus.

In the near-term future, a strong expansion in business investment by domestic corporations is unlikely. Even though tax reform may have a positive affect on real investment in the long run, its short-term impact is likely to be adverse. In contrast to domestic corporations, foreign businessmen are making important capital investment decisions. They are shifting their wealth portfolios from dollar-denominated financial assets into real assets.

Some improvement in this nation's net export position is a reasonable prospect. There has been a marked and a sustained weakening in the value of the dollar. It is important to recognize that the shifts in currency values have missed important sources of our trade imbalance, such as Korea. It is also important to recognize that the declining value of the dollar is a two-edged sword. It means that absolutely necessary imports cost us more and that similarly price-inelastic exports bring us less. Notwithstanding such considerations, it is plausible to believe that the changed currency values can result in an expansion in exports and a slowdown in the growth of imports. The short-term shift can be important and can convert itself into a force persisting over several years.

Although minor, such improvements in business investment and in the nation's net export position have already begun to drive the federal budget toward surplus. Even with such small shifts, we can expect about a $50 billion decline in the federal deficit during calendar 1987. Such an improvement is likely to go largely unnoticed. But if such shifts are sustained, the federal deficit can be effectively erased.

DIXIE M. BLACKLEY
Working Wives and Residential Structure: Evidence from the Chicago Metropolitan Area

There has been a major change in residential location patterns over the past four decades. Locational patterns in the metropolitan US have been characterized by an historic trend of population redistribution from central cities to their surrounding urban areas. The proportion of the US metropolitan population residing within central city boundaries declined from 57 percent in 1950 to 40 percent in 1980. In Chicago, the central city's share of the metropolitan population fell from 57 percent in 1960 to 42 percent by 1980.

This shift in residential location has been accompanied by a major socio-economic change. Namely, labor force participation rates for married women have increased dramatically. The participation rate for married women who are living with their husbands increased from 23.8 percent in 1950 to 52.1 percent in 1980, with nearly 12 percent of the increase coming in the 1970s.

Most studies explaining why people move to the suburbs have emphasized the trade-off between access to central employment in the city versus cheaper housing services and residential space in the suburbs. This study shows that the rapid growth of two-earner families (that is, married women in the work force) and the decentralization of metropolitan employment are facts that also need to be considered in analyzing residential location patterns. Beyond that, this article specifically considers the interaction between optimal housing consumption and residence location.

The data and methodology used in this study are presented in the next section. Following this is a discussion of the results and implications. The article concludes with a short review of the findings.

Data and Methodology

The study utilizes a sample of nonelderly, married, renter households derived from the 1975 metropolitan Chicago *Annual Housing Survey* and from its *Journey to Work* supplement. Average annual income in the sample is $18,867 for two-earner households and $12,750 for one-earner households. A similar income differential remains even after controlling for residence and workplace locations. Two-worker households tend to be younger and more educated than their one-worker counterparts. About 65 percent of two-earner households are childless couples. Working wives earn an average of $6,894, and their husbands earn $11,571. Working mothers earn lower average annual incomes than other working wives. Working women travel

shorter distances to work and are more likely to use public transit than working men.

Before attempting to evaluate housing demand and residence location, it is necessary to examine the variation of housing prices in different areas. By specifying gross rent as a function of dwelling unit, neighborhood, and locational characteristics, the relative contribution of a particular housing attribute to the rental value of a typical dwelling unit can be identified. The relative contribution of nonlocational attributes is assumed to be identical for all directions from the city center while locational effects may vary with direction. Noncentral employment centers are identified in five directions from the city center by examining the distribution of employment in the Chicago metropolitan area. The intrametropolitan variation in the price of per unit of housing services is summarized by comparing the estimated rental value of a constant quality bundle of housing characteristics at a reference location with the estimated rental value of an identical bundle at alternative locations throughout the Chicago metropolitan area.

As noted, housing price initially declines as distance from the city center increases, rises as suburban work places are approached, and declines again thereafter. It reaches relative minimums to the north, west, and southwest at about 13 to 15 miles from downtown Chicago. For the O'Hare airport center to the northwest and the Lake Calumet industrial area to the south, the minimum housing price occurs at about seven to eight miles from the city center.

Like other studies, this article emphasizes the trade-off between housing expenditures and commuting costs in residential location decisions. In terms of economic theory, an optimal location is achieved if the marginal saving in housing expenditures (that is, cheaper housing services) associated with a longer commute is just offset by higher commuting costs. The household adjusts its residence location and expenditures to achieve an optimal location. The adjustments are especially complex if husbands and wives are employed at different workplaces. In such circumstances, the relative valuation of the husband's and wife's commuting time plays an important role in a household's willingness to reside closer to one workplace than the other. This study improves on most of the previous work by considering the interaction between optimal housing consumption and residence location, the potential difference between one- and two-earner households, and the effects of multiple (rather than just one) employment centers.

Results

The key empirical results for housing demand and residence location are reported in Table 1 and Table 2. Results are reported in terms of elasticities, the percent change in quantities sold of a variable divided by the percent change in its price or some other relevant variable. For example, Table 1 indicates that the price elasticity of housing demand is –0.305. This means that each 10 percent increase in housing price results in a 3.05 percent decrease in housing demand.

Housing demand for a one-earner household is relatively unresponsive to changes in price or current income (see left hand column of Table 1). The price elasticity of housing demand is –0.305; while the elasticity of demand with respect to changes in the husband's income is 0.264. Other income and the husband's commuting distance have a negligible impact on housing demand. Not shown in Table 1 are results relating to commuting cost variables associated with the distance and mode of travel to work or demographic variables reflecting family size and composition. None of these variables exerted a statistically significant effect on housing demand.

The two-earner results (right hand column) indicate that housing demand for renter households is less responsive to changes in price and income from alternative sources than for one-earner households. The price elasticity of housing demand equals –0.171, and the husband's earned income elasticity equals 0.137. The working wife's earnings have no systematic influence on housing consumption. Such a finding suggests that the contributions of a wife to household income may be viewed as transitory. As with one-earner households, housing demand of two-earner households is generally unresponsive to household commuting costs and demographic characteristics.

Results relating to residence location for one-earner households indicate that a 1 percent increase in earned income is associated with an increase in commuting distance of 0.437 percent. This suggests that the beneficial aspects of housing consumption at a distant location outweigh the adverse effects of added commuting. The mode of travel to work and demographic variables also included to represent commuting costs do not show a strong association with commuting distance.

Many studies have also found a positive relationship between income and residence distance from the city center. However, there is little evidence regarding the relationship between residence distance to the city center and workplace distance to the city center. That is, do households who work farther from the city center have shorter or longer commutes than those who work in the city center? Theory is ambiguous. On the one hand, the benefits of a longer commute to a suburban worker are less than those to a city worker because the housing price gradient is flatter for suburban workers. On the other hand, the cost of travel may be less in the suburbs because suburbs tend to be less congested. The evidence in this study indicates that suburban workers tend to have longer commutes than city workers. More precisely, commuting distance for one-earner

Table 1. Impact of Selected Variables on Housing Consumption

	Percentage Response in Housing Consumption[a]	
One Percent Increase in:	One-Earner households	Two-Earner households
Housing price	–0.305*	–0.171*
Husband's earned income	0.264*	0.137*
Wife's earned income		.022
Other income	.0009*	.010*
Husband's commuting distance	0.005	.002
Wife's commuting distance	NA	0.005

*Statistically significant at the ten percent level.
[a] The percentage change in one variable divided by the percentage change in another variable is elasticity.
  Number of observations = 391.

Table 2. Impact of Selected Variables on Residence Location for Two-Earner Households.

	Percentage Response in:	
	Husband's Commuting Distance	Wife's Commuting Distance
One Percent Increase in:		
Husband's earned income	0.213**	0.102*
Wife's earned income	0.207	0.256*
Husband's commuting distance	NA	–0.165
Wife's commuting distance	–0.282*	NA
Husband's workplace distance from the city center	0.201	NA
Wife's workplace distance from the city center	NA	0.481
Distance between husband's and wife's workplaces	0.470*	0.123

*Statistically significant at the ten percent level.
[a] The corresponding number for one-earner households is 0.437.
  Number of observations = 388.

households is positively related to the distance of the workplace location from the city center. The estimated elasticity is .927.

Two-earner family residential location patterns are detailed in Table 2. The relative location of household workplaces is the primary determinant of a husband's commuting distance, whereas own workplace location and commuting costs are the key determinants of a wife's commuting. Neither spouse's earnings has a significant impact on the distance a husband journeys to work. A husband's commuting distance varies directly with the distance separating household workplaces and inversely with the wife's commuting distance. Furthermore, a husband's commute is longer if household workplaces are located in the same direction from the city center.

These results suggest that a husband tends to travel to work from a residence located near his wife's workplace. It is tempting to believe that a two-earner household favors the wife's workplace due to the high opportunity cost of her commuting time. Such a view would reflect the fact that, in general, a wife tends to shoulder a larger share of housework and child-care responsibilities than the husband. Unfortunately, the data are inconsistent with this interpretation. The data show that a working wife's earnings have no systematic impact on housing consumption or on her husband's

commuting behavior. Hence, it is not the earning power of a wife that draws a household to a specific location. Rather, the overall results are consistent with the view that residence location is chosen relative to the husband's workplace; subsequently, his wife finds a job nearby.

A working wife's commuting distance varies directly with her own earnings but is not significantly affected by her husband's earnings or by the presence of children. Such findings are inconsistent with evidence from other studies suggesting that a wife's labor force behavior is influenced by these factors. Working wives employed in the central city commute roughly three times as far as otherwise similar women employed in the suburbs. Presumably, more centrally located jobs offer higher wages, thereby enticing the wife to endure a longer commute. Because housing costs rise as the center of the city is approached, a household's willingness or ability to favor the wife's workplace in its residence location choice (already weak, at best) diminishes further as she is more centrally employed.

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Summary

The increase of wives entering the labor force and development of suburban employment centers have changed the way people choose a house and its location. This article shows that income levels remain the key variable in the choice between central city and suburban living and documents the impact of suburban employment on the price of housing services. In addition, this study indicates that the work location of a working wife has relatively little influence on her family's housing consumption and residence location choice. Thus, the empirical evidence for the Chicago metropolitan area generally does not support the argument that the increase in the number of two-earner households will play a major role in the revitalization of the central city.

More specifically, the study finds: (1) that income increases are associated with increases in both commuting distance and the consumption of housing services. These results suggest that as income rises, the increase in marginal benefits associated with greater housing consumption more than offsets the increase in marginal costs associated with higher commuting time costs. As a consequence, both one- and two-earner households are induced to choose less central locations. (2) that the work location of working wives has relatively little influence on their families' housing consumption and residence location choice. (3) that Chicago housing prices, standardized for housing services provided, reflect the distance from the central business district *and* suburban work places. Previous studies have incorrectly ignored the effect of more than one business district. In the Chicago metropolitan area, the price of housing services declines as the distance from the city center increases, but rises as suburban work places are approached; then declines again thereafter.

Job Growth: Which States Have a Comparative Advantage and Why

J ob growth in a state is a consequence of the unique economic climate present in the state. Those characteristics expected to lead to greater job growth are typically regarded as favorable. The first section of this article estimates the comparative advantage of each state using data from the period 1980 to 1985. In particular, the focus will be on the East North Central states of Illinois, Indiana, Michigan, Ohio, and Wisconsin. The second section of the article identifies factors that enhance a state's comparative advantage in employment. The final section provides estimates of the contribution of each of the identified factors to job gains (losses) in the state of Illinois.

Identifying a State's Comparative Advantage

State employment gains in a particular industry can be attributed to three factors: employment gains related to the growth of the US economy; gains related to differential employment growth among industries; and gains related to differential employment growth among states. The last component, which is the focus of this article, indicates a state's comparative advantage, that is, the number of additional jobs in a particular industry the state can provide relative to the US average. In the regional analysis literature, this type of decomposition is referred to as the shift-share technique.

These compositional effects can be illustrated by examining employment changes in Illinois manufacturing. From 1980 to 1985, Illinois lost a total of 227,000 manufacturing jobs, a decline of 18.8 percent. US manufacturing employment fell 5.25 percent over the same period. The greater decline in Illinois manufacturing employment relative to the United States signals the state's weak economic position and translates into a loss of 163,000 Illinois jobs. (See Table 1) At the same time, total US employment increased 7.6 percent, providing 92,530 additional jobs for Illinois. Finally, the slower growth of US manufacturing employment relative to total US employment growth, contributed to the loss of 156,000 jobs. The loss of 163,000 jobs due to Illinois' comparative disadvantage, the gain of 92,530 jobs due to growth in US total employment, and the loss of 156,000 jobs due to a shift in the industrial mix of US employment add up to a total loss of 227,000 manufacturing jobs over the period 1980 to 1985. Table 1 provides a similar breakdown for job gains in total and services employment. The remainder of this article will focus solely on employment change due to each state's comparative advantage.

Table 1. Decomposition of Job Gains and Losses for Illinois, 1980–1985 (in thousands of jobs)

	Total Employment	Manufacturing	Services
Total gain or loss (sum of effects)	−83	−227	158
Gain or loss due to: Comparative advantage	−454	−163	−52
US growth	371	92	72
Industrial mix	0	−156	138

Source: *Employment and Earnings*. Bureau of Labor Statistics

Table 2. Comparison of State and US Growth in Total Employment for Selected Periods

	Percent Change		
	80–85	75–80	75–82
US	7.7	17.9	16.7
IL	−1.7	9.8	3.9
IN	2.2	9.7	4.5
OH	0.3	8.7	2.7
MI	1.8	9.8	1.8
WI	2.0	15.6	11.3
PA	−0.4	7.2	3.3
AZ	26.0	39.1	41.3
GA	18.9	23.0	25.4
FL	23.7	30.2	37.0
NH	21.0	31.5	34.6

Source: *Employment and Earnings*. Bureau of Labor Statistics

Comparing Each State's Comparative Advantage

As discussed, a state's comparative advantage in providing jobs is measured by employment growth in a given industry relative to US average growth in that industry. States can be categorized into two groups: those that experienced greater growth in industry employment than the US average for that industry and those that experienced less or negative growth. Table 2 illustrates the growth of total employment for the East North Central states and the US for selected periods. For the period from 1980 to 1985, as well as for the earlier periods 1975 to 1980 and 1975 to 1982, total employment growth in Illinois lagged very much behind US growth. This holds true for the East North Central states and Pennsylvania as well. In comparison, employment growth in Arizona, Georgia, Florida, and New Hampshire greatly outpaced total US employment growth during these periods.

Each state's comparative advantage in total, manufacturing, and services employment is presented in Table 3. To permit meaningful cross-state comparisons, the figures in this table are presented as jobs gained per 1,000 people.

In terms of their competitive position in providing total jobs, Illinois, Indiana, Michigan, Ohio, and Wisconsin ranked near the bottom of the list, 48th, 39th, 40th, 45th, and 42nd, respectively. With regard to Illinois, a loss of 40 jobs per 1,000 people (or 454,000 jobs in absolute numbers, see Table 1) over the five-year period can be attributed to Illinois' comparative

Table 3. Job Gain (Loss) in Total, Manufacturing, and Services Employment per 1000 People, 1980–1985

	Total Employment			Manufacturing Employment			Services Employment		
	Total Gain or Loss	Gain or Loss Due to Comparative Advantage	States Ranked by C.A. (1 = most C.A.)	Total Gain or Loss	Gain or Loss Due to Comparative Advantage	States Ranked by C.A. (1 = most C.A.)	Total Gain or Loss	Gain or loss due to Comparative Advantage	States Ranked by C.A. (1 = most C.A.)
AL	17	−10	29	−2	3	20	10	−2	22
AK	154	122	1	−4	−2	38	38	22	1
AZ	97	68	2	10	13	2	33	17	2
AR	25	0	23	0	5	12	11	−0	17
CA	47	15	15	3	7	8	20	0	16
CO	59	26	8	4	8	7	23	4	10
CT	46	10	19	−10	−2	39	21	1	12
DE	57	23	9	2	8	9	NA	NA	NA
DC	21	54	5	0	1	25	NA	NA	NA
FL	87	59	3	6	8	5	33	15	3
GA	74	44	6	6	11	3	21	8	6
HI	19	−13	32	−2	−1	29	12	−10	43
ID	9	−18	37	2	5	13	6	−8	40
IL	−7	−40	48	−20	−14	51	14	−4	32
IN	9	−21	39	−9	−2	37	13	−1	19
IA	−12	−41	49	−14	−9	48	8	−8	41
KS	13	−18	36	−7	−3	41	9	−7	38
KY	10	−15	34	−6	−2	33	10	−3	25
LA	4	−24	43	−9	−6	46	11	−4	26
ME	36	8	21	−6	−1	28	NA	NA	NA
MD	41	10	20	−5	−2	34	NA	NA	NA
MA	48	12	18	−3	3	19	NA	NA	NA
MI	7	−22	40	−2	4	16	11	−4	33
MN	24	−10	30	1	6	11	16	−4	31
MS	3	−22	41	−0	4	15	4	−7	37
MO	26	−5	27	−2	3	21	14	−4	28
MT	−3	−30	44	−3	−2	32	6	−9	42
NB	14	−16	35	−5	−2	31	17	1	15
NV	57	19	12	3	5	14	34	−12	44
NH	88	56	4	7	14	1	29	12	4
NJ	49	17	13	−8	−3	42	26	8	5
NM	40	13	17	2	4	18	16	1	14
NY	31	−0	24	−9	−4	45	19	−2	23
NC	45	14	16	1	9	4	15	2	11
ND	9	−20	38	−0	1	24	13	−4	27
OH	1	−30	45	−13	−7	47	11	−5	35
OK	14	−15	33	−6	−3	43	10	−4	29
OR	−6	−36	47	−6	−1	30	9	−7	39
PA	−1	−32	46	−20	−14	50	17	−1	21
RI	29	−3	25	−9	−2	36	NA	NA	NA
SC	35	6	22	−9	−2	35	16	5	9
SD	14	−12	31	2	4	17	12	−4	30
TN	25	−4	26	−3	3	22	15	1	13
TX	58	27	7	−4	0	27	23	8	7
UT	51	22	11	4	7	9	NA	NA	NA
VT	46	16	14	−3	2	23	17	−1	20
VA	54	23	10	2	6	10	24	8	8
WA	24	−6	28	−4	0	26	16	−1	18
WV	−26	−51	51	−14	−11	49	8	−3	24
WI	8	−23	42	−9	−3	44	11	−6	36
WY	−11	−46	50	−4	−3	50	9	−5	34

Source: *Employment and Earnings*, Bureau of Labor Statistics

disadvantage. However, the loss due to Illinois' weak competitive position was partially offset by the positive effect of overall US growth on Illinois employment. As a consequence, actual job loss in Illinois in total employment over the five-year period was seven jobs per 1,000 people (83,000 jobs in absolute figures, see Table 1).

The East North Central states, with the exception of Michigan, ranked below average in terms of their comparative advantage in providing manufacturing jobs as well. Illinois, Indiana, Ohio, and Wisconsin ranked 51st, 37th, 47th, and 44th respectively.

Michigan ranked 16th. In terms of their comparative advantage in providing service jobs, these states did not fare much better. Out of 44 states, Illinois, Indiana, Michigan, Ohio, and Wisconsin ranked 32nd, 19th, 33rd, 35th, and 36th.

Factors Affecting a State's Comparative Advantage

State-specific characteristics affect a state's ability to provide jobs. Following the lead of an article by William Kahley published in the May 1986 issue of *Economic Review* (a publication of the Federal Reserve Bank of Atlanta), this section examines factors that are expected to contribute to a state's comparative advantage.

Factors that are thought to contribute to a state's comparative advantage include the skill level of the workforce. A skilled workforce might be valuable to employers and enhance a state's comparative advantage in providing jobs. It also seems reasonable to hypothesize that location of a state would be an important contributor. One would expect the sunbelt states to have a comparative advantage over states with a relatively harsher climate. Another factor is the average wage level in a given state. Wages represent a cost to employers and higher than average wages are expected to reduce a state's comparative advantage in providing jobs.

Comparative advantage may also be influenced by per capita state taxes. Higher per capita taxes may provide a comparative disadvantage because taxes represent a cost or burden. However, higher taxes provide the means to fund public services and may represent a state benefit. An additional factor is the number of union workers in a state as a percentage of all workers. A less-unionized workforce is expected to improve a state's comparative advantage. Finally, average energy prices in a state may be important. Higher prices are expected to affect a state's position negatively.

Regression analysis was used to determine the statistical relationship between the identified factors and a given state's comparative advantage in providing jobs in terms of total employment, services, and manufacturing employment. Comparative advantage was measured as in Table 3 using population-adjusted figures to permit cross-state analysis.

Factors Found to Be Important Contributors

This section examines factors contributing to job growth in total manufacturing, and services employment. In terms of total job creation, average state wages, the severity of a state's climate, skill level (measured as the percentage of the population with a college education), and state per capita tax burden affect a states' comparative advantage (see Table 4). As expected, average wages, measured by average hourly wages of production workers on manufacturing payrolls, have a negative and statistically significant effect on a state's comparative ability to provide total jobs. Other things equal, a ten-cent decrease in Illinois average manufacturing wages in 1980 from $8.02 to $7.92 per hour would generate 13,282 additional jobs over the subsequent five-year period.

Skill level, as measured by the percentage of the population over 25 years of age with a college education, was found to have a positive and statistically significant effect on a state's relative ability to provide total jobs.

In 1980, the percentage of Illinois' population over age 25 with a college education was 16.2 percent, identical to the US average. All else equal, a 1 percent increase in Illinois' college educated population, equal to an additional 10,820 people, would generate 9,237 additional jobs in total Illinois employment during the subsequent five-year period.

Table 4. Factors That Would Enhance Illinois' Comparative Advantage in Providing Jobs

Given:	*Number of Jobs Created 1980–1985*		
	Total Employment	*Manufacturing*	*Services*
10 cent decrease in average manufacturing wages in IL	13,282 *	3,099 *	2,841 *
1% decrease in severity of Illinois' climate	5,058 *	991 *	1,027 *
1% increase in IL population over 25 with a college education (= 10,820 people)	9,237 *	219[a]	1,446 *
1% increase in IL population over 25 with a high school education, (= 44,000 people)	2,959[a]	2,921 *	NA
1% decrease in per capita tax burden (= $4.44)	1,730	(102)[a]	163[a]
1% decrease in unionized workforce in IL (= 14,870 workers)	362[a]	973	NA

Notes: This table is based on data for 1980 and 1985. The changes in the factors are based on their values in 1980.
[a]indicates that the factor was not retained in the final equation.
*means that the coefficient used to compute the results was statistically significant at conventional levels.
Data sources *US Statistical Abstract, 1986; Employment and Earnings.* Bureau of Labor Statistics, various issues; Historical Climatology Series, 5-1, State, Regional and National Monthly Seasonal Degree Days Weighted by Population, 1980; *State Energy Price and Expenditure Report.* Department of Energy, 1970–1981; and State Government Collections, 1980.

As expected, the severity of a state's physical climate was found to have a statistically significant adverse effect on a state's ability to provide jobs in total employment. Severity of climate was measured by the sum of heating and cooling degree days in 1980 (the number of degrees by which the average temperature on a given day deviates from the norm of 65). The "sun states," California, Florida, Texas, Louisiana, Arizona, Georgia, and South Carolina are at a comparative advantage while northern states like North Dakota, Minnesota, Vermont, Maine, New Hampshire, Wisconsin, and Montana are at a comparative disadvantage. For Illinois, all else equal, a 1 percent decrease in the severity of Illinois' climate would lead to an increase of 5,058 jobs in total employment over a five-year period.

Per capita taxes as measured by the sum of state corporate income, personal income, and general sales taxes divided by state population, were found to have a negative but statistically insignificant effect (at conventional levels) on a state's comparative advantage in providing total employment. Despite this factor's statistical insignificance, it was retained in the final analysis. All else equal, a 1 percent reduction in 1980 Illinois per capita taxes, equal to a decrease of $4.44, would increase total employment by 1,730 jobs over the five-year period.

With respect to total employment, three additional factors were examined but not included in the final analysis (see Table 4 notes). These factors consist of skill level measured as the percentage of population with a high school education, percentage of workforce in a union, and average state energy prices. The first two factors were each examined in conjunction with average wages, percentage of the population with a college education, state climate, and per capita tax burden. While each was found to have a statistically insignificant effect on a state's comparative advantage, they did affect a state's comparative advantage as anticipated. An increase in a state's high school educated population was found to enhance the state's comparative advantage, while an increase in the unionized workforce was found to affect the state's competitive position adversely. Neither factor was retained in the final analysis.

Finally, state energy prices as measured in average price per million BTU, were expected to negatively affect a state's position and play an important role in determining a state's comparative advantage. However, this result did not turn out in the case of total, manufacturing, or services employment, and so this factor was eliminated from further analysis.

Table 4 also indicates important factors that contribute to a state's comparative advantage in manufacturing and services employment. Factors found to be important to job growth in total employment are found to be important in these sectors as well. In particular, average wages, physical climate, and skill level were found to have a statistically significant effect. However, the two measures of skill affected states' comparative advantage in providing employment in these sectors differently. Skill level, as measured by the college educated population, was found to have a statistically significant effect on services, signalling that a more highly educated population enhances a state's competitive position in providing service employment. This is a result similar to that found for total employment. Other things equal, a 1 percent increase in the college educated population as of 1980 would create 1,446 jobs over a five-year period.

However, in the case of states' comparative advantage in manufacturing, skill level as defined by the high school educated population was found to be statistically important. As Table 4 shows, other things equal, a 1 percent increase in the high school educated population would create 2,921 jobs during the subsequent five-year period. When college educated population was included as well as high school

educated population (and the remaining factors, see Table 4), this factor had a positive but insignificant effect.

In terms of manufacturing, an additional factor, the percentage of unionized workers in a state was examined. The analysis shows a negative but statistically insignificant relationship between the percentage of workers unionized in a state and a given state's comparative advantage. However, this factor was retained in the final results due to its theoretical importance. Other things equal, a 1 percent decrease in the number of union workers in Illinois in 1980, equal to 14,870 workers, would generate 973 additional jobs over the subsequent five year-period.

Per capita taxes were not found to enhance or diminish a state's comparative advantage consistently for total, manufacturing, and services employment. Instead, the results indicate that per capita taxes diminish a state's comparative advantage in providing jobs in total employment (as previously discussed) and services but enhance a state's comparative advantage in providing manufacturing jobs. However, for all three cases, these relationships are found to be statistically insignificant.

Conclusion

During the period 1980 to 1985, as well as during the preceding five years, growth in Illinois' employment greatly lagged behind the US average. This slower growth is made evident by Illinois' rank of 48th, 51st (out of 50 states and D.C.) and 32nd (out of 44 states) in terms of the state's relative ability to provide jobs in total, manufacturing, and services employment, respectively. Important contributors to Illinois' comparative disadvantage were found to be higher than average hourly manufacturing wages in 1980 and the relative severity of Illinois' climate. While it is clearly impossible for Illinois to relocate to the sunbelt, the evidence suggests that Illinois' competitive position can be improved by a decrease in average wages, relative to other states. Another means to enhance Illinois' comparative advantage is by having an increasingly educated population, relative to the US average. In 1980 the percentage of Illinois' population with a high school education and the percentage with a college education were on par with the US average. The findings with respect to taxes do not offer clear guidance for Illinois tax policy.

Illinois Business Indexes

The BEBR's leading indicator continues to provide evidence that Illinois may be headed for an economic downturn. As Chart 1 shows, the three-month moving average (MA 3) fell below the six-month moving average (MA 6) in April and remained below in May. If the MA 3 index remains below the MA 6 index during the months of June and July, the four-month trend will signal that there will be a downturn in the Illinois economy beginning within the next few quarters. However, the actual turning point in economic activity cannot be predicted with certainty.

Growth in Illinois retail sales from one year prior has significantly outpaced inflation as measured by the Chicago CPI, indicating the current strength of the Illinois economy. As Chart 2 shows, retail sales increased 10.7 percent from April 1986 to April 1987.

At the same time, as Chart 5 shows, inflation grew at 4.4 percent, producing real growth of 6.3 percent.

The Chicago help-wanted advertising index (see Chart 3), which measures the volume of classified ads in major Chicago newspapers, grew 29.1 percent from May 1986 to May 1987 providing further evidence of the strength of the Illinois economy. However, the St. Louis index (see Chart 4) has not shown such positive signs. During the period July 1986 to May 1987, with the exception of November 1986, the help-wanted advertising index for St. Louis declined from its value one year prior.

Finally, Charts 5 and 6 indicate that inflation in April and May has continued the pace set in March. Prices grew 4.4 percent in Chicago and 3.74 percent in St. Louis over the period May 1986 to May 1987.

ILLINOIS BUSINESS INDEXES

	Percent Change May 1986– May 1987	May 1987	April 1987	March 1987	Feb 1987	May 1986	April 1986
Leading Indicator(MA3)	5.32[a]	10.67	12.13	13.88	14.45	5.35	2.62
Leading Indicator(MA6)	9.86[a]	12.50	13.27	12.48	12.46	2.64	1.76
Employment-manufacturing (in thousands)[b]	0.50	927.3	926.6	925.9	926.5	922.7	927.8
Average weekly hours-manufacturing[b]	1.98	41.3	41.2	41.5	41.5	40.5	40.6
Weekly earnings-manufacturing[b]	3.98	$448.93	$447.43	$451.11	$448.62	$431.73	$431.58
Help wanted advertising-Chicago (1969 = 100)[c]	29.07	111	105	113	113	86	94
Help wanted advertising-St. Louis (1969 = 100)[c]	−3.08	63	63	68	70	65	65
Retail Sales (in millions)[d]	−2.88	$5,775	$6,082	$5,713	$4,952	$5,946	$5,496
Coal production (in thousands of tons)	−14.52	4,664	5,457	5,145	5,010	5,456	5,866
Petroleum products (in thousands of barrels)[b]	−11.78	2,000	2,000	2,080	1,898	2,267	2,376
Vendor performance[e]	9.09	60%	57%	55%	52%	55%	50%
Building permits (in thousands)							
Residential housing units	−16.38	5.095	4.624	4.170	2.521	6.093	6.362
Value of Residential housing	−3.38	$361,550	$384,791	$312,391	$192,823	$374,180	$374,451
Value of nonresidential construction							
Industrial buildings	−43.03	$28,477	$37,927	$26,564	$6,136	$49,990	$21,912
Office, banks, and professional buildings	37.08	$40,327	$46,810	$36,002	$41,551	$29,418	$32,654
Stores and other mercantile buildings	−8.56	$40,746	$26,679	$36,081	$25,312	$44,558	$36,378
Other	104.21	$5,681	$5,661	$4,701	$6,037	$2,782	$3,903
Consumer price index (December 1977 = 100)							
North Central US[f]	3.74	180.8	180.4	179.5	178.5	—	173.9
North Central/population more than 1,200,000[f]	3.49	184.5	184.0	183.2	182.5	—	177.8
North Central/population 360,000 to 1,200,000[f]	4.30	179.5	179.5	177.8	177.2	—	172.1
North Central/population 50,000 to 360,000[f]	4.51	176.9	176.1	175.3	173.6	—	168.5
North Central/population less than 50,000[f]	2.71	174.9	174.6	174.0	172.9	—	170.0
Chicago (1967 = 100)	4.38	338.4	337.1	335.5	334.2	324.2	323.7
St. Louis (1967 = 100)	3.74	330.5	—	328.8	—	318.6	—
		1986:IV	1986:III	1986:II	1986:I	1985:IV	1985:III
Personal income (in millions)[b,g,h]	4.03	$180,153	$178,757	$179,622	$174,013	$173,178	$170,458
Per capita personal income[b,g,h]	3.41	$15,513	$15,490	$15,029	$15,051	$15,001	$14,788

[a]Represents absolute change (percent change not relevant), [b]Recent month is preliminary figure, [c]The Conference Board, *Help Wanted Advertising*, May 1987; [d]Latest month projected by BEBR, [e]Percentage of companies receiving slower deliveries, [f]Percent change between April 1986 and April 1987; [g]Seasonally adjusted at annual rates; [h]Percent change between 1985 IV and 1986 IV

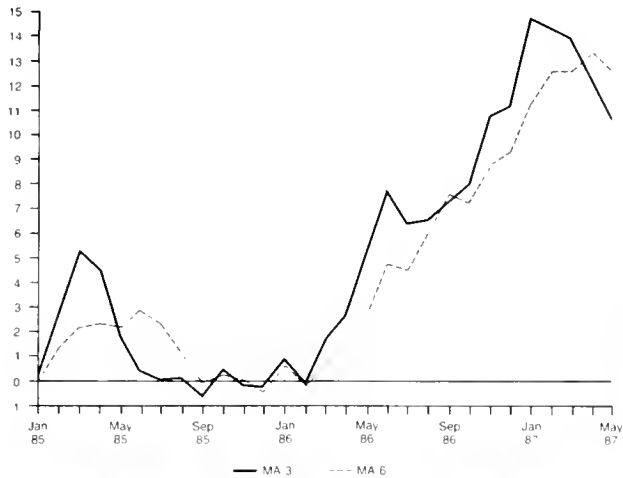## Chart 1. Composite Leading Indicator (average percent change in base indexes)

Y-axis: 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0, -1
X-axis: Jan 85, May 85, Sep 85, Jan 86, May 86, Sep 86, Jan 87, May 87
Legend: — MA 3   --- MA 6

Chart 2. Year-to-Year Percent Change in Illinois Retail Sales

Values: 3.9%, 1.9%, 7.9%, 8.5%, 4.2%, 11.0%, 2.5%, 8.2%, 6.6%, 10.7%
X-axis: Jul 85-Jul 86, Sept 85-Sept 86, Nov 85-Nov 86, Jan 86-Jan 87, Mar 86-Mar 87, April 86-April 87

Chart 3. Year-to-Year Percent Change in Help-Wanted Advertising—Chicago

Values: 2.0%, 2.0%, 6.3%, 9.4%, 5.8%, 16.3%, 7.7%, 21.5%, 20.2%, 11.7%, 29.1%
X-axis: Jul 85-Jul 86, Sept 85-Sept 86, Nov 85-Nov 86, Jan 86-Jan 87, Mar 86-Mar 87, May 86-May 87

Chart 4. Year-to-Year Percent Change in Help-Wanted Advertising—St. Louis

Values: -3.0%, -1.5%, -7.5%, -1.6%, 9.2%, -7.5%, -2.9%, 0.0%, -2.9%, -3.1%, -3.1%
X-axis: Jul 85-Jul 86, Sept 85-Sept 86, Nov 85-Nov 86, Jan 86-Jan 87, Mar 86-Mar 87, May 86-May 87

Chart 5. Year-to-Year Percent Change in Chicago CPI

Values: 2.1%, 1.7%, 2.3%, 1.9%, 2.2%, 1.6%, 2.5%, 2.4%, 3.6%, 4.1%, 4.4%
X-axis: Jul 85-Jul 86, Sept 85-Sept 86, Nov 85-Nov 86, Jan 86-Jan 87, Mar 86-Mar 87, May 85-May 87

Chart 6. Year-to-Year Percent Change in St. Louis CPI

Values: 1.78%, 1.27%, 0.68%, 1.33%, 3.01%, 3.74%
X-axis: Jul 85-Jul 86, Sept 85-Sept 86, Nov 85-Nov 86, Jan 85-Jan 86, Mar 85-Mar 86, May 85-May 86

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Illinois Business Review

Bureau of Economic and Business Research

428 Commerce West, 1206 South Sixth Street

Champaign, Illinois 61820

Illinois Economic Outlook

Illinois Current Economic Indicators

	History				Forecast			
	86:II	86:III	86:IV	87:I	87:II	87:III	87:IV	88:I
Personal income (in millions)								
Total personal income	$179,662	$178,757	$180,153	$181,586	$180,672	$183,463	$187,616	$191,000
Manufacturing	28,684	28,871	29,334	30,172	30,276	30,517	30,666	30,824
Services	30,295	30,791	31,256	31,691	31,295	32,172	33,519	34,482
Wholesale and retail trade	22,748	23,085	23,355	23,821	24,249	24,694	25,137	25,582
Finance, insurance, and real estate	11,562	11,869	12,196	12,056	11,850	12,078	12,554	12,810
Employment (in thousands)								
Private nonfarm employment	4,045	4,109	4,116	4,113	4,117	4,124	4,128	4,132
Manufacturing	922	920	924	928	920	915	909	902
Services	1,120	1,133	1,138	1,138	1,146	1,155	1,163	1,172
Wholesale and retail trade	1,176	1,182	1,198	1,208	1,215	1,221	1,227	1,232
Finance, insurance, and real estate	345	348	350	350	354	358	361	364

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The Illinois Econometric Model predicts steady growth in nonfarm employment. However, manufacturing employment is expected to decline by 0.35 percent during 1987 while employment in the other sectors is forecast to remain steady or increase. The wholesale and retail trade sector is expected to lead the way with growth in 1987 of 2.5 percent.

The growth rate of personal income is more erratic than the growth rate in employment as indicated by the accompanying chart. The state experienced a decline in personal income in the third quarter of 1986 and a decline is forecast for the second quarter of 1987. The growth through the first quarter of 1988 is supported by increased activity in the service, wholesale and retail, and financial sectors as indicated in the table.

Illinois Personal Income and Employment (annualized growth rates)

Bureau of Economic and Business Research

Illinois
Business
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JAMES R. FOLLAIN

The US Secondary Mortgage Market: Born in a Regulated Environment but Flourishing in a Competitive One

The secondary mortgage market in the United States began in the 1930s with the creation of the Federal National Mortgage Association (FNMA). A restructuring of FNMA in 1968, the creation of the Government National Mortgage Association (GNMA) in 1968, and the establishment of the Federal Home Loan Mortgage Corporation (Freddie Mac) in 1970 are also important dates in the history of the secondary mortgage market in the United States. Since a somewhat modest beginning, the secondary mortgage market has evolved into a large and sophisticated enterprise. The amount of new mortgage-backed securities issued in 1986 exceeded the total amount outstanding at the end of 1983, and the total dollar volume of mortgage-backed securities traded in 1986 nearly surpassed 3 trillion dollars—an amount in excess of the dollar volume of equities traded in the major American stock exchanges.

Three main reasons were usually cited as the basis for the creation of an secondary mortgage market in the United States:

(1) The secondary mortgage market improves the geographic match between the demand for mortgages and the supply of household deposits. The market allows areas with excess deposits to purchase mortgages from areas with an excess demand for mortgages.

(2) An opportunity for the federal government to manage the housing cycle better. Throughout the 1960s and 1970s many argued that the regulations on financial institutions that limited the interest that lenders could pay for savings (Reg Q) resulted in unnecessary volatility of the business cycle. As market interest rates rose above ceiling rates, savers withdrew funds from the traditional suppliers of mortgage funds—the savings and loan associations (S&Ls)—thus reducing the supply of mortgage credit and bringing housing construction to a sudden halt. The secondary mortgage market was able to reduce some of this cyclicality in housing by purchasing more mortgages during periods of high rates of interest, thus increasing the supply of mortgage credit.

(3) The secondary mortgage market provides an opportunity for lenders to reduce their interest rate risk. A portfolio of fixed-rate mortgages and short-run liabilities can be quite sensitive to changes in the level of interest rates. The secondary mortgage market reduces some of this risk in that it allows lenders to reduce their holdings of fixed-rate mortgages by selling them in the market. This is a relatively new benefit

brought about by the increased volatility of interest rates in the 1970s and 1980s. Other reasons have been cited [7], but these three were the most important.

A common thread among the three factors is the regulation of Savings and Loans in the United States. With the deregulation of the S&L industry, one might have thought—and many did—that the growth in the secondary mortgage market would decline. Deregulation brought with it the end of regulated deposit rates, a move to national banking and the end of geographical segmentation, and the authority to issue new types of mortgages less sensitive to interest rate risk, that is, the adjustable-rate mortgage. Surprisingly, perhaps, these changes did not slow the growth in the secondary mortgage market. Indeed, since deregulation began in 1981, the growth has been greater than at any other time in the history of the secondary mortgage market.

The growth in the issuance of mortgage-backed securities is depicted in the chart. About $14 billion in mortgage-backed securities were issued in 1970, and this amount rose to over $71.9 billion in 1979. The share of these instruments secured by conventional mortgages also grew substantially. As large as this growth was, it was modest in comparison to the growth during the 1980s, especially 1986 [6]. The issuance of mortgage-backed securities in 1986 equalled approximately $262.3 billion, more than the total amount of mortgage-backed debt outstanding at the end of 1983, though some of this growth was due to the inflation of housing prices. Also, 1986 was marked by the greatest surge in refinancing ever and a restructuring of FNMA's portfolio—less buy-and-hold and more mortgage-backed securities. Thus, the 1986 growth in the secondary mortgage-market per se is overstated. However, a good portion is directly linked to the long-run growth of the secondary mortgage market.

Volume of Mortgage-Backed Securities Issued from 1970–1986
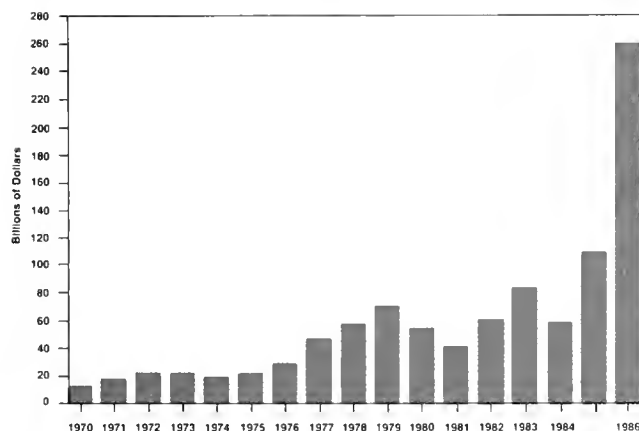
The purpose of this article is to focus upon the question of why growth has been so substantial in the recent past. It is argued that the original basis for a secondary mortgage market was largely unique to the US financial system and that the secondary mortgage market did not represent a desirable aspect of a thoroughly modern financial system. It was simply a way of improving the workings of a highly regulated system during periods of volatile interest rates. This is not so of the growth since deregulation. It appears now that the cost of raising funds for mortgages via the secondary mortgage market in a deregulated environment marked by volatile interest rates and blessed with computer technology is likely to be comparable to, and possibly less than, the cost of raising funds by traditional methods—that is, household deposits. The growth in the secondary mortgage markets suggests that any differential that may have existed has certainly narrowed. Some of the factors that have produced a decline in the cost of raising funds in the capital market and an increase in the cost of raising funds via traditional methods are explored here.

Reasons for the Recent Rise in the Secondary Mortgage Market

For years S&Ls enjoyed a variety of benefits that guaranteed that they would be the lowest-cost producer of mortgages. These included preferential tax treatment, regulated deposit rates that helped S&Ls at the expense of banks, regulated markets that limited nationwide banking and, most important, deposit insurance. FNMA, Freddie Mac, and GNMA also had an advantage relative to private conduits in that they had the benefit of a federal guarantee. Most observers felt that in the 1970s the advantages to the S&Ls outweighed the advantages to the three main issuers of mortgage-based securities. However, recent changes in technology, the economic environment, and the regulatory structure have reduced, and possibly eliminated, the advantage of the S&Ls over the competition in the secondary mortgage market.

A number of factors are responsible for the reduction in the advantage of the S&Ls. Some have served to reduce the cost of funds to the secondary mortgage market. These include: computer technology; standardization of the mortgage contract and process; a large increase in the demand for long-term financial assets by institutional investors; and an increase in the desire by a variety of financial institutions to restructure portfolios. Other factors, especially those related to deregulation of financial institutions, have increased the cost of funds to S&Ls, thus further reducing their comparative advantage.

Computer Technology

An interesting discussion of the actual and potential future impact of computer technology is presented by Kevin E. Villani [8]. In brief, he argues that computer technology offers substantial opportunities to the secondary mortgage market and that the future will see a rapid increase in its use. Ultimately, Villani believes, the computer will cut the average time from application to funding from six weeks to one week.

One area in which the computer will likely help the secondary mortgage market is mortgage origination. Several new firms have already been created that allow consumers to shop via computer for the cheapest mortgage, for example, Shelternet. So far, it appears they have met with only limited success. It seems that consumers are not quite ready to forsake the personal touch offered by the traditional system. However, as consumers become more familiar with computers, they should become comfortable with a computer search of a mortgage menu.

Another area already affected by computer technology is the transmittal of loan data between lenders and the organizations purchasing the mortgages. MIDANET—Freddie Mac's Mortgage Information Direct Access Network—"eliminates the two most time consuming steps in an secondary mortgage market transaction: the transfer of data from a lender's computer onto paper and the subsequent transfer of the data from paper back to the computer at Freddie Mac" [8].

A third area in which the computer will help the secondary mortgage market involves the trading of securities, not just whole loans. One particular problem in this area is that some transactions fail because of improper paperwork. To reduce this problem, Freddie Mac has developed a book-entry system in which the Federal Reserve Bank of New York serves as a registrar. This will eliminate some paperwork, the need for couriers, and float. FNMA and GNMA are developing similar systems [3].

It should be noted that the impact of computer technology to date has been a little slower and different from what some expected. For example, many agree that the computer-based search for mortgages has not yet grown to some initial expectations. Also, Warren Lasko of the Mortgage Bankers Association points out that many believed computer technology would lead to a greater concentration of loan servicing firms than has occurred. Despite the fact that computer technology has not transformed the industry as fast as some expected, its introduction has almost certainly tipped the scales away from the traditional S&L approach, which is based upon face-to-face contact and extensive "bricks and mortar."

Standardization of the Mortgage Process

One of the difficulties in the marketing of mortgages is the uncertainty on the part of the investor regarding the mortgage being purchased. Granted, the 30-year mortgage has been around for a long time, but there can be wide variations in the underwriting process and the kinds of supporting documents associated with the mortgage. Gradually, the three major institutions in the US have worked to standardize the underwriting and record-keeping process. FNMA and Freddie Mac now have widely accepted underwriting criteria, appraisal practices, and forms. These improvements have led to the standardization of the process surrounding the fixed-rate mortgage.

One example of the standardization process concerns the adjustable-rate mortgage. The introduction of the generic, adjustable-rate mortgage brought with it many different varieties. It became clear, however, that some standardization would be necessary, and the efforts of Freddie Mac would play a major role in the reduction of the number of adjustable-rate mortgages on the market from well over 100 to 5 or less. A similar result occurred in the private mortgage insurance industry. This industry is subject to a variety of state regulations; however, the dominance of the agencies in the secondary mortgage market has led to a more standard set of regulations for mortgage insurers. Indeed, some have called Freddie Mac the "de facto" regulator of this industry.

An Increase in the Demand for Long-Term Assets by Large Institutional Investors

The amount of funds available to large institutional investors has grown substantially in recent years. Part of this is due to demographic factors—baby-boomers are saving for retirement—and some is due to the fact that insurance companies as well as other types of investors have been able to attract a large volume of funds for investment. The complete set of factors underlying this growth is open to debate, but the fact of the growth is not.

One consequence of this growth is that institutional investors are willing to purchase long-term assets like mortgages to diversify their portfolios. In the words of Lewis S. Ranieri of Salomon Brothers, one of the people from Wall Street responsible for the growth of the secondary mortgage market, "the astounding growth of dollars for investment in the hands of portfolio managers of all types—pension funds, state and local retirement systems, insurance companies, bank trust departments and thrift institutions" led to the growth in the demand for assets that the secondary mortgage market was able to meet [I]. Not only did the secondary mortgage market satisfy this demand, it also produced a wide variety of adaptations of the traditional 30-year mortgage to make it considerably more attractive to the institutional investor. One example of this is the collateralized mortgage obligation.

Portfolio Restructuring

Portfolio restructuring refers to the actions taken by a portfolio manager to update the amount and composition of the portfolio assets. One motive underlying such restructuring is to ensure that the interest rate exposure of the portfolio's assets is in line with the interest rate exposure of its liabilities (that is, match the durations of a portfolio's assets and liabilities). Portfolio restructuring for this purpose is occurring more often because of the increased volatility of interest rates and the increased sophistication of financial economists and analysts. This restructuring increases the demand for assets that can be easily bought and sold. As a result, the demand for

mortgage-backed securities has increased relative to less liquid mortgage loans. Another consequence is the introduction of new derivatives of the mortgage-backed securities that cater to the diverse demands of pension fund managers. For example, STRIPS—mortgage pools in which the interest and principal payments are sold separately—produce two separate products: one for those who are looking for substantial protection from interest rate risk and another for those willing to accept substantial interest risk.

Another motive underlying portfolio restructuring is the desire to generate arbitrage profits. Arbitrage profits can be earned by purchasing assets that are undervalued and selling (go short) assets that are overvalued. If this is done and the opinions of the investor are correct, then profits can be made. It is quite common for the major brokerage houses to advertise their strategies for this type of arbitrage with mortgage-backed securities of different age, coupon, and so on. Such activities are beneficial to the health of the economy because they produce lower mortgage interest rates. They also ensure that capital flows into those sectors in which the returns are highest and, as a result, the marginal productivity of capital is greatest.

Deregulation

The Congress passed historic legislation in 1980 that deregulated the rates S&Ls could pay on their deposits. The pressure to do so came from many different quarters, including small savers who felt cheated by artificially low rates. The legislation led to an increase in the cost of funds to the S&Ls and reduced the advantage of S&Ls over other kinds of institutions making mortgage loans. It did not completely eliminate their advantage because S&Ls still had something nonfinancial institutions did not have—access to underpriced deposit insurance for deposits up to $100,000 through the Federal Savings and Loan Insurance Corporation (FSLIC).

The combination of higher deposit costs and relatively fixed returns on its long-term mortgage assets caused a serious squeeze for many S&Ls. Since then, many S&Ls have gone out of business. Others have speculated on very risky projects, some of which have gone sour. These failures have placed tremendous pressure on the FSLIC. According to very recent reports, the FSLIC has potential liabilities amounting to well over $20 billion and assets of less than $1 billion. The result is additional upward pressure on the cost of funds to the S&Ls because it increases the riskiness of deposits in such a system. Although the new banking bill passed in August will relieve some of this pressure, it is too early to tell if it is enough.

Conclusions

Implicit in this direction is the belief that the tide is swiftly changing so that the secondary mortgage market will soon be the dominant source of funds for long-term housing mortgages. This is a dramatic change from the traditional S&L system in which the mobilization and lending functions of the housing finance system were conducted by the same institution—the S&L. The future will no longer require that these functions be carried on by the same organization. Indeed, it is likely that the two functions will become increasingly separate in the future. S&Ls and mortgage bankers will probably specialize in origination, a process that is likely to become even more computerized. S&Ls may get more involved in nonstandardized segments of the market, such as development and joint ventures, thus becoming less housing oriented. Mobilization, on the other hand, will become increasingly the domain of the major federal agencies or the domain of the large private Wall Street brokerage firms who become expert in the issuance of real estate mortgage investment conduits. Although these developments will reduce the role of the S&Ls, they will also be likely to produce lower mortgage interest rates—something most participants in the housing market welcome enthusiastically.

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ROGER BECK AND WILLIAM HERR

Are More Jobs the Answer to the Economic Development of Southern Illinois?

By most standards the economic situation in southern Illinois is anemic. Per capita income in recent years averaged about 20 percent lower than in the rest of the state. While the income gap between the region and the rest of the state narrowed in the 1970s, the income convergence stalled in the early 1980s. Moreover, unemployment levels in southern Illinois have averaged higher than in the rest of the state.

It is not surprising that programs to stimulate economic growth have been a high priority to the people of the region. The purpose of this article is to examine the economic performance of the region by industry for clues that may shed light on future prospects for growth of the region.

The data used for this analysis are prepared by the US Bureau of Economic Analysis (BEA), Regional Economic Measurement Division. The county data used to estimate employment and wages and salaries are largely obtained from reports made by firms covered by unemployment insurance. Adjustments are made by the BEA to these wages and salaries to reflect noncovered employment.

The Region's Competitive Position

An examination of the performance of the southern Illinois economy relative to the performance of the Illinois economy can be based on employment or wages and salaries. In this section we examine employment changes in 11 industrial groups between 1970 and 1984. For the 15-year period, employment in southern Illinois increased by 61,500 or 14 percent. Nearly two-thirds of this net increase occurred in firms and establishments classified as service industries. The service sector includes personal (for example, laundry and repair), business (for example, employment and data processing), recreation, health, and educational services. Smaller but substantial employment gains occurred in the mining, retail, and finance sectors. Significant declines occurred in manufacturing, farming, and transportation (Table 1).

In order to determine the region's competitive position, we estimated employment in southern Illinois assuming the region had the same industrial makeup and the same industry employment growth rates as the state as a whole. If the economic structure and growth rates had mirrored the state, employment would have grown by 48,900 (487,700 − 438,800) or only 11 percent. Thus the region's performance as

measured by employment was better than would have occurred if its employment experience had been the same as in the state as a whole. It created 12,600 more jobs (500,300 − 487,700) than could have been expected if it had performed in the same fashion as did each of the state's industries during this period. This difference is identified as the region's relative competitive position. In Table 1 it is shown as an index that was computed by dividing actual employment by expected employment in 1984.

If this performance could continue, it would, of course, be a hopeful sign for employment levels in southern Illinois compared to the state. However, the performance of the state's economy has not been particularly strong, especially in the latter years of the study period. Hence, the relative position of the region does not portend a strong regional growth rate in absolute terms.

Despite this caveat, there are a number of related questions that can be profitably explored if we are to understand the region's past economic growth and future potential. Some of these questions include: (1) Has the competitive position of the region changed through time? (2) Which industries within the region are most (least) competitive? (3) Where are the competitive industries located? and (4) Are the conclusions concerning the region the same if the region's competitiveness is based upon income instead of employment? Each of these questions is discussed in this article.

Relative Competitiveness of the Region's Industries

It is useful to compare actual employment changes in the region's industries to the change in employment that would have occurred if these industries had grown at the state's rate. Such a comparison yields insights concerning the relative competitiveness of the 11 industries. The index of relative competitiveness helps identify which industries account for the change in the region's competitiveness between 1970 and 1984. For example, during the period four of the eleven industries (wholesale, mining, construction, and finance) registered a positive competitive position of more than 5 percent. In contrast, three industries performed less well than the same industry for the state as a whole (Table 1). The weakest sectors were agricultural services, transportation, and service industries with indexes of 78, 84, and 98, respectively.

It may seem incongruous that the largest actual gain in regional employment occurred in the service industry, yet this sector showed a competitive disadvantage relative to the state. As it turns out, if the service sector in the region had grown at the same rate as in the state, employment in the sector would have been even larger. Specifically, it would have employed 1,700 more persons than it actually did. For the eight industries that have a relative competitiveness index of more than 100, actual employment increased more or declined less than occurred in employment in those industries in the state.

Changes in the Competitiveness of the Region through Time

We also examined the region's competitiveness for the five-year period, 1979–1984. The decade of the 1970s was generally one in which basic commodity-producing industries in Illinois were prosperous and growing. The natural resource sectors of farming and mining were especially strong. The manufacturing sector of the state's economy had grown in the early 1970s but by the latter years of the decade had stagnated and then declined, as was true of manufacturing in

Table 1. Employment in Southern Illinois by Industry, by Year and, by Expected Employment in 1984 (hundreds)

Industry	Actual Employment[a]		Change 1970–84	Expected Employment 1984[b]	Relative Competitiveness 1979–84[c]
	1970	1984			
Agricultural production	412	348	− 64	344	101
Agricultural services	15	25	+ 10	32	78
Mining	116	260	+ 144	221	118
Construction	239	244	+ 5	227	107
Manufacturing	863	680	− 183	655	104
Transportation and communications	277	226	− 51	269	84
Wholesale trade	111	180	+ 69	140	129
Retail trade	674	812	+ 138	782	104
Finance, insurance, and real estate	158	263	+ 105	247	106
Services	689	1,092	+ 403	1,109	98
Government	834	873	+ 39	851	103
TOTAL	4,388	5,003	+ 615	4,877	103

[a]Sources: US Department of Commerce, BEA, Local Area Personal Income and Employment, County Summary Tables. [b]Assumes the region had the same industry mix and the same total employment growth rates as the state between 1970 and 1984. [c]Actual 1984 employment divided by 1984 expected employment

other midwest states. After 1979, the natural resource industries weakened considerably, and the secular decline in manufacturing deepened. Illinois lost 260 thousand jobs in manufacturing between 1979 and 1984. Employment in these basic goods-producing industries account for 25 percent of the region's total employment. Trends in these base sectors were expected to have an impact on residentiary industries such as service, retailing, finance, and so on and, hence, could be expected to affect the region's competitiveness.

Total employment in southern Illinois increased by 2 percent between 1970 and 1984. As before, we estimated employment growth in southern Illinois assuming the region had the same industry makeup and the same industry growth rates in this period as occurred for the state. Under this assumption employment in southern Illinois would have increased somewhat more than was actually observed. Thus, the competitive advantage observed over the long period, 1970–1984, disappeared in the 1979–1984 period (Table 2). In the latter period the region's competitive loss was about 6,400 jobs for a relative loss of 1 percent.

The relative competitiveness of the region's industries was somewhat different in 1979–1984 from that observed during the entire 15 year period. From 1979 to 1984, when the overall competitiveness of the region disappeared, only two (mining and manufacturing) of the eleven industries registered competitive position vis-à-vis the state, of 5 percent or more. The favorable competitive position of manufacturing occurred even though actual employment declined by 16,100 between 1979 and 1984. Had the sector's employment performance been the same as that of the state as a whole, employment would have declined even more.

Even though these two competitive strong sectors—mining and manufacturing—accounted for less than one-fifth of the region's total employment in 1984, performance in these base industries can be expected to have a multiple effect on the region's overall economy. This may account for the relatively favorable indexes of competitiveness for the construction, retail, and finance industries (Table 2).

Location of Industries Showing Relative Competitiveness in Southern Illinois

The southern Illinois counties posting the strongest competitive position between 1970–1984 were Effingham, Jackson, Jefferson, Monroe, Randolph, and Williamson. In these counties seven or more industries registered actual employment levels that were more than 5 percent above the expected level in those industries in the state. That is, those industries had employment levels in 1984 that were above levels that would have been expected had employment in the county's industry changed by the same rate as in the state. On the other hand, 10 counties had three or fewer industries registering employment levels of 5 percent or more above the expected level in those industries in the state. Seven of these counties were located in the southern portion of the region (see the map).

The Region's Competitiveness as Measured by Income

Alternatively, the region's relative competitiveness could be measured by income rather than employment. Perhaps the first thing to observe is that personal income per employee in southern Illinois averages less than 80 percent of the level received in the rest of the state. Income per employee in southern Illinois averaged lower in virtually all industries and for all three years except in mining (Table 3). In that industry, income per employee in 1979 and 1984 in southern Illinois averaged 12 and 25 percent, respectively, above the industry average for the rest of the state. Income per employee in the manufacturing and government sectors of southern Illinois, while below the rest of the state, ranked second and third behind mining in 1984. Income per employee in the agriculturally related groups of industries in southern Illinois was comparable to that industry's average compensation in the rest of the state in 1970 but in latter years turned unfavorable.

Sectors in which income per employee was especially low relative to the rest of the state included farming, wholesale trade, finance, and the service establishments. In 1984 income per employee in these southern Illinois industries averaged about two-thirds or less of the amount received by employees in these industries located elsewhere in the state.

Lower average income per employee in southern Illinois than in the rest of the state means that a given increase in employment in southern Illinois is not

Location of Industries Having a Relative Advantage in Southern Illinois

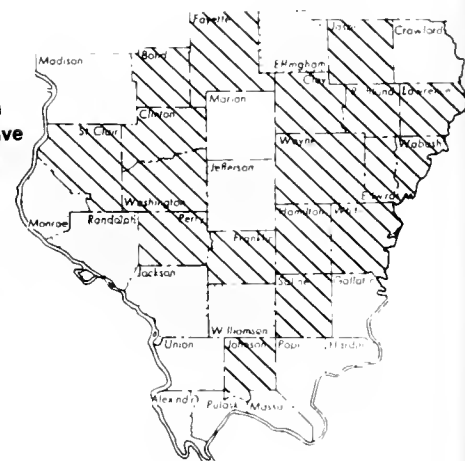Number of Industries in County Showing a Relative Competitive Advantage
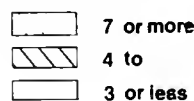
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Table 2. Employment in Southern Illinois by Industry, by Year, and by Expected Employment in 1984 (hundreds)

Industry	Actual Employment[a]		Change 1979–84	Expected Employment 1984[b]	Relative Competitiveness 1979–84[c]
	1979	1984			
Agricultural production	410	348	− 62	344	101
Agricultural services	19	25	+ 6	34	74
Mining	183	260	+ 77	241	108
Construction	243	244	+ 1	244	100
Manufacturing	841	680	− 161	647	105
Transportation and communications	284	226	− 58	246	92
Wholesale trade	132	180	+ 48	282	64
Retail trade	758	812	+ 54	803	101
Finance, insurance, and real estate	221	263	+ 42	257	102
Services	899	1,092	+ 193	1,110	98
Government	914	873	− 41	859	102
TOTAL	4,904	5,003	99	5,067	99

[a]Sources US Department of Commerce, BEA, Local Area Personal Income and Employment, County Summary Tables [b]Assumes the region had the same industry mix and the same industry employment growth rates as the state between 1979 and 1984 [c]Actual 1984 employment divided by 1984 expected employment

likely to have as much secondary impact on incomes as in the rest of the state. Thus, for example, if employment in base industries such as farming, mining, and manufacturing were to increase, even though secondary employment would likely increase, income in retail, service, and finance sectors would increase by smaller increments than would be likely to occur in other areas of the state. Based on this observation, we recalculated the region's competitiveness based on income shares rather than employment.

Table 3. Ratio of Income per Employee in Southern Illinois to the Rest of the State (in percent)

	1970	1979	1984
Agriculture production	35	54	37
Agricultural services	100	86	85
Mining	92	112	125
Construction	79	78	77
Manufacturing	88	95	94
Transportation and communications	86	85	79
Wholesale trade	74	74	68
Retail trade	85	86	83
Finance, insurance, and real estate	72	61	51
Services	67	67	65
Government	87	85	88
TOTAL	77	81	78

Sources US Department of Commerce, BEA, Local Area Personal Income and Employment, County Summary Tables

We found that income in southern Illinois grew more than if the region's growth had been the same as income growth in the state between 1970 and 1984. The 3 percent faster growth, termed the region's competitive advantage, was the same as when the region's competitiveness was measured by employment. If we focus only on the latter five years of the period, we find the competitive advantage disappears. This is the same result as when we based our analysis on employment. Thus, the unit of measurement has no appreciable effect on our conclusions.

During the 1970–1984 period, seven industries registered a relative competitive advantage, whether this competitive advantage was based on employment or income. The real estate-finance industry showed a favorable competitive position when based on employment but an unfavorable competitive position relative to the state when based on income. The other three industries—agricultural services, transportation, and service—showed a weak competitive position whether this competitiveness was measured by employment or income.

In the 1979–1984 period when the region's competitiveness declined relative to the state, only three industries—mining, manufacturing, and government—showed a favorable competitive position using both measures. Four industries—agricultural services, transportation, wholesale, and service—showed a competitive disadvantage relative to the state using both measures.

Conclusions and Implications

Based on employment and income, the southern Illinois economy showed favorable growth in the 1970–1984 period relative to the rest of the state. However, in the 1979–1984 period this competitive edge disappeared. Strong competitive sectors, whether measured by employment or income, in the more recent period include mining, manufacturing, and government. These three sectors also have the highest average relative wages and salaries per person. We conclude that in the near term, developments in these three sectors will substantially affect the economic growth of the region.

The low average level of income per employee in southern Illinois relative to the rest of the state indicates that increasing employment, as important as that might be, might not lead to gains in economic welfare that many expect. While efforts to boost the region's employment must continue, especially in the three sectors identified as being most competitive, one should not lose sight of long-run benefits accruing from improving the skills and abilities of the labor force. Such a strategy improves the capabilities of the labor force and can help attract higher paying industries.

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By Faith and Credit: Economic Growth in the 1980s

Economic growth in the 1980s has been uneven and, on the whole, sluggish. This is the apparent outcome of economic policies that aimed at rapid growth and that have used deficit financing on a large scale to avoid high federal income taxes, which were expected to have a depressing effect on the economy. The federal budget deficit has parallels in two other deficits: a shortfall in export income over payments for imports and a continuing and worsening backlog of environmental disutilities. Analysis of the economic policy that has been followed since 1981 should consider all three deficits.

Growth of National Product and Employment

In the 1980s, the national product of the United States has grown at an apparent rate slightly below that prevailing since early in the century. Based on *Historical Statistics of the United States* up to 1960 and thereafter on recent issues of *Survey of Current Business*, the following are the compound rates for annual growth of real GNP, by sub-periods reflecting presidential terms: 1909–1952, 2.9 percent; 1953–1960, 2.7 percent; 1961–1968, 4.5 percent; 1969–1976, 2.3 percent; 1977–1980, 3.0 percent; and 1981–1986 2.4 percent.

In total, real GNP rose by over 40 percent in the 1961–1968 period, by just under 20 percent in the period 1969–1976, by nearly 13 percent during the 1977–1980 period, and by over 15 percent 1981–1986. Hence, by conventional criteria, the current administration has not done particularly well by the national economy. It is true that GNP statistics contain large difficulties of concept and measurement that are by no means resolved, so we should be cautious about concluding that the economy has slowed down. The contrast with the 1960s is, in any event, large enough that it must be real to some extent. The 1980s cannot on any tenable grounds be said to have done better than the sluggish growth of the 1970s.

Population growth is nearly 1 percent per year, hence the rate of improvement in per capita income in the 1980s has been barely 1 1/2 percent annually. With increasing inequality of income, large numbers of the poor and lower middle classes have actually become worse off in recent times.

Wage employment has increased at nearly the same rate as GNP, at least since 1968. The last six years have seen the employed civilian labor force increase by over

11 million, compared with 10 1/2 million in the preceding four years and almost 11 million in the eight years before that. Such increases reflect increasing participation of women in the labor force, and they also include the result of the increasing preponderance of service activities over goods production in the US economy. Wage employment in goods production fell by about 3/4 million in the last six years; it rose by over 2 million in the preceding four years and fell by less than half a million in the period from 1960 to 1976. Service occupations thus increased more than did total employment in 1981–1986 and in 1969–1976, but less so in 1977–1980. The subcategory "services" (without further description) represented half the employment increase 1981–1986 against much lesser fractions in the preceding periods.

Gross wages per hour or per week culminated in 1977–1978 and are now lower (in constant dollars) by 5 percent (hourly) or 10 percent (weekly); the difference between these reflects a decline in the length of the average work week. In part, the shortening in the average work week reflects the fact that there is substantial part-time employment in the services.

All of this deals with economic activity as encompassed by official statistics. The "second" or "underground" economy is not included. This exclusion may cloud the precise meaning of some of these data.

There has been much interest in the increasing preponderance of services in the US economy. This is more evident in current data than in those measured in money of constant purchasing power. In current terms, production of goods declined from over 46 percent of the national product in the late 1960s to only about 40 percent recently. In constant-term data, the change is less apparent. In such terms, goods and services matched closely from the late 1960s to the late 1970s, and only since 1980 has the service category begun to exceed goods production; in 1986, goods were worth 80 percent of the services in current terms and 90 percent in constant dollars.

Growth of the labor force nearly matching that in national product gives no indication of much change in productivity, a problematic concept I shall not try to explain here.

Investment and Saving

Before the 1980s, investment in the US economy was roughly in step with savings. In the 1980s the gap has widened. The following gives percentages of GNP, average per year:

	Gross Investment	Gross Private Savings	Therefore: Personal	Other
1969–76	15.5	15.5	5.2	10.3
1977–80	16.3	16.0	4.0	12.0
1981–86	15.4	13.8	3.8	10.0

In the last three years, investment has averaged about 16 percent per year, against 14 percent in 1981–1983. Savings remained about the same percentage in both three-year periods. The last year, 1986, shows the lowest figure for savings, 12.6 percent in total and 2.8 percent personal savings.

The figures for the 1980s again present a somewhat weaker picture than the preceding periods, as regards savings. Investment differs less, despite the dip in the national product. Whatever may be said about the accounting difficulties, two things stand out: domestic savings have been insufficient to cover the demand for investment funds, and neither savings nor investment is in any way greater now than in earlier periods. This is contrary to what was expected from the economic policies begun in 1981.

The gap between investment and savings was presumably filled by foreign-owned funds coming in. The gap in foreign payments has increased every year, reaching nearly $150 billion in 1986. Over the five- to six-year period, there has been a $500 billion cumulative total.

The ostensibly conservative policy of the Reagan administration has the extraordinary feature of combining a sharp increase in defense spending with a lowering of the income tax. The budget deficit, which was a predictable consequence, was supposed to be filled by increased tax revenues stemming from vigorous economic growth stimulated by the tax reduction. Lower taxes would mean more savings. To that extent, the policy failed.

The expectation that larger disposable incomes would lead to higher rates of savings is widespread among economists. Indeed, some regard it as a leading tenet of economic theory. The failure of this theory to bear out in real life in the United States of the 1980s makes it necessary to reevaluate the assumptions about income and savings.

There are really two statements that must be discussed separately. First, savings are positively related to incomes; second, because of this, rising private incomes would lead to higher savings rates. This consequence should be more true if the rise in incomes, because of the tax changes in this case, led people with high incomes to retain a larger part of their incomes as disposable. Make the rich richer and savings will go up as a consequence, so the second statement says.

The first of the two statements is a trivial truth. Census after census bears it out, in country after country: the rich save a larger fraction of their incomes than do the poor or even the middle classes. The propensity to save, or the demand for savings if you will, is the reverse of Engel's Law. Expenditures for food and other necessities increase more slowly than other expenditures, leaving more to be saved or spent on luxuries. People in higher income brackets do indeed save more than people in lower income brackets, in a given country at a given time. This is a static truth.

But the second statement is a *non sequitur*. If it were true that more inequality of income always leads to higher savings rates, then the highest savings rate in the world would be found in Latin America. That region has the largest inequalities of income. But this is far from being so. Savings rates in Latin America are not particularly high. The expectation that larger disposable incomes, especially among higher incomes, would lead to higher savings rates was really without foundation. In the dynamic sense, the second statement is a fallacy.

How the propensity to save may react to changes in the level and distribution of income is not a matter on which economic theory can throw much light. Rather, we should look to socio-cultural explanations such as those proposed by Thorstein Veblen almost a century ago. Snob effect, status symbols, and other nonproductive ways of spending may indeed come into a different degree of prominence when the social and economic climate changes. In the case of the United States in the 1980s, it may be plausible to suggest that the general atmosphere of optimism encouraged by the current administration may have generated a lower sense of responsibility for the use of private money.

The Federal Budget Deficit

The federal government deficit is not necessarily comparable to a deficit in budgets at the state, local, or private levels. The reason is that the national government alone has the power to make new money and does so in more or less reasoned proportion to the need for more money as the economy expands. A recent analysis by T.M. Holloway in *Survey of Current Business* (March 1986) pointed to the relation between national debt and national product as the logical basis for evaluating federal budget policy. That proportion had been as high as over 55 percent in the mid 1950s and had since fallen almost continuously until the mid 1970s, when it stabilized at about 26–27 percent. Beginning in 1982, the percentage turned upward again and reached over 37 percent in the fourth quarter of 1985. According to Holloway, a falling percentage means that the budget is in a real sense over-balanced; only a rising percentage makes the budget under-balanced in a real sense. In 1981, the falling proportion of the national debt to the national product, he felt, contributed to the recession. By the same token, the boom in 1983 was set off by the rising deficit—a standard Keynesian remedy, and we have had only sluggish growth in 1985 and 1986. According to the Holloway analysis, a budget deficit of $48 billion would mean a balanced budget in real terms. Thus, if Gramm-Rudman fails to balance the budget in conventional terms, no great harm may follow. But if the deficits continue as large as they are, the result will be either recession or inflation, depending on which monetary solution is adopted.

The budget deficit would, in itself, have a stimulus effect on the economy because a large part of it is used by the military, a sector that responds to politico-administrative imperatives rather than market forces. It is of some interest to note the relation between defense expenditures for durable goods (mainly weapons and ships) to the deficit in external payments.

The Trade Deficit

The deficit in foreign merchandise trade is, above all, one of trade in durable goods. Over the years 1983–1986, the annual trade deficit has risen from $5 billion in 1983 to $149 billion in 1986, for a four-year total of $336 billion. In the same years, the total of durable-goods imports over exports of the same group of goods went from $29 billion in 1983 to $103 billion in 1986, totaling $271 billion in four years, or more than 80 percent of the trade deficit in those years. In 1986, the durable-goods deficit was 69 percent of the total trade deficit.

This commodity composition of the trade deficit is noteworthy because durable goods have been a weak subsector in the US economy in the 1980s, with a slower growth rate than all goods production. This weakness in the production of durable goods is related to the relatively weak performance in investment despite the influx of foreign funds into the US investment market. The 1986 net imports of durable goods represents 1/7 part of all civilian demand for such goods (for investment and consumption) and is somewhat larger than the federal government's purchases of durable goods for the Defense Department.

Such a weakness in durable goods production and trade is further evidence of the relative weakness of economic growth in the 1980s. With defense purchases in the range of 10–11 percent of all durable goods produced in the country, the sector has received considerable stimulus financed by the federal deficit. This stimulus should have extended to the willingness of the defense contracting industries to invest, given the often long-term nature of defense procurement contracts. It is plausible that without this deficit-financed expansion of defense procurements, growth in heavy industry would have been even weaker, and so would investment.

The increasing flow of foreign investments into the United States has also had the consequence of changing the sign of the national-account item called "factor income from abroad," which is now negative after having been positive for many years. This change renders the credit that the economy can take from its rate of growth one shade weaker.

The Deficit on Environmental Disutilites

The deficit in environmental quality is long standing. It exists and keeps mounting because we are enjoying many industrial products without paying the full cost of their production. Here, as in the case of petroleum and some other natural resources, we are "living off the capital" with insufficient provision for eventual replacement.

Only intermittently do the news media mention that current policy in Washington downplays environmental protection even more than was done in previous years. Toxic dumps are largely left unreclaimed, making the hazards more deepseated and the eventual cleanup more expensive. On acid rain, Canada calls for action, and the United States promises research. Large parts of the country have streams and ground water of impaired quality. The replacement in bottled water counts as an addition to national product without counting the negative entries of the water that became undrinkable. The southwestern quadrant of the United States keeps overusing scarce water, with creeping desertification as a consequence.

A pervasive thought underlying such a policy toward environmental degradation is the notion that the environment is somehow less important than marketable goods and services. We are often told that cleaning up the poison dumpsites cannot be done because "it costs too much." At the same time, expanding production of market goods and services is hailed as a good thing because it creates jobs and incomes.

It is an elementary fact of national accounting that anything that costs money also creates jobs and incomes, and vice versa. It is true that cleaning up dumpsites and reversing the consequences of acid rain costs money, but these activities also employ people and generate measurable additions to national product. And while the manufacturing of Cadillacs and cosmetics creates jobs and generates income, it also necessitates expenditures on the part of whoever is to use them. The two faces of national accounts, the product and the expenditure side, have to match; only temporarily can they diverge in a country that affords itself the luxury of a large deficit in foreign account.

The difference between market production and environmental protection is not in the concepts of costs and values, but in uses—for individual consumption or for collective consumption. Collective consumption is more difficult to visualize, essential as it may be. Pollution does not always come to the same people who enjoy the market production. Industrialists whose factories and power stations produce poison dumps and acid rain often can afford to live far away from the pollution. In contrast, those who live on a dump or under the acid rain may not be able to afford all the luxuries for the sake of which the pollution was generated. This difference in the incidence of pollution is one more point where economic inequality has been increasing in recent times.

Favoring current consumption at the expense of squandering long-term assets is a policy that caters to the short-sighted wishes of people whose horizons will only include the remote future if they are so educated. As current politics, the emphasis on market goods is the easy way out. The regime that takes a public stance that neglecting the overhead is all right will eventually have to answer for the consequences of leading public opinion in the wrong direction.

The deficit in overhead capital of environmental quality cannot be estimated in hard statistical terms. Intuitively, it seems certain that it is far greater than either the federal budget deficit or the foreign-trade deficit.

If matters such as poison dumpsites, acid rain, ground water quality, and desertification were to be addressed on a scale that would yield sizeable results, then one of two things would need to be done. Either income taxes would have to be raised or the federal budget deficit would need to become even larger.

Conclusions

Examining the record of six years of ostensibly conservative economic policy, the results are far from reassuring. The policy in place has emphasized faith in the government and the solidity of credit at both the fiscal and the national-account levels. The results are so far below what had been hoped for that they may well be more than balanced by the continuing deficit in overhead capital such as natural resources and environmental quality. The policy of the 1980s has not safely guarded the nation's future.

The general impression is of an economic system that may not be making any real progress in the total balance. This is rendered even more problematic by the signs of increasing economic inequality as evidenced by the data on part-time employment and falling weekly average wages. Lowering the standard of living of the poor is not just something that should offend the human heart. It also tends to impair the nation's human capital and to render it more difficult to mobilize all its resources.

Economic policy needs thorough reevaluation. We must avoid the mistake of relying on simplistic theory and the record of the past. There must be more attention to what really goes on in the economic system.

Folke Dovring, a former United Nations official, taught land economics and economic development in the University of Illinois Department of Agricultural Economics, 1960–1987. His writing on macro economic subjects include three recent books, Riches to Rags *(1984),* Land Economics *(1987), and* Productivity and Value *(1987).*

Illinois Business Indexes

Recessionary pressures continue to build in the Illinois economy. Since April, the composite leading indicator has followed a downward trend, indicating a slowdown in economic activity. As chart 1 shows, the three-month moving average (MA3) has been below the six-month moving average (MA6) for four consecutive months. Although timing of the actual downturn cannot be predicted, the composite leading indicator series has historically led the downturn by 7–14 months.

In contrast to the composite leading indicator series, individual indicators continue to send mixed signals about the health of the state's economy. Since April, the number of residential housing permits issued has consistently been below the number issued in 1986 (Chart 2). Also, the value of industrial buildings was 52 percent lower in July 1987 than in July 1987. In contrast,

professional and mercantile buildings have shown marked increases over last year. Furthermore, as shown in Chart 3, real retail sales rebounded in June. For two Illinois industries, coal and petroleum, output levels remain below 1986 levels (Chart 4). In contrast, the manufacturing sector remains strong. Both employment and average weekly hours worked increased in July over a year ago. Also in July, the Chicago help wanted index was 16.5 percent higher than its year-earlier level, while the St. Louis help wanted index decreased.

Inflation has continued at a modest rate. The July 1986–July 1987 change in the CPI for the north central US was 3.58 percent—down from May's yearly rate of 3.78 percent but higher than the 1986 rate of 0.8 percent. Two trends continue: growth in manufacturing earnings has kept pace with inflation (Chart 5) and St. Louis inflation has remained below Chicago's (Chart 6).

ILLINOIS BUSINESS INDEXES

	Percent Change July 1986– July 1987	July 1987	June 1987	May 1987	April 1987	July 1986	June 1986
Leading Indicator (MA3)	4.02[a]	10.38	11.49	10.67	12.13	6.36	7.67
Leading Indicator (MA6)	6.70[a]	11.19	12.55	12.50	13.27	4.49	4.67
Employment-manufacturing (in thousands)[b]	0.86	930.3	929	927.1	926.6	922.4	923.9
Average weekly hours-manufacturing[b]	2.48	41.4	41.8	41.4	41.2	40.4	41.0
Weekly earnings-manufacturing[b]	4.20	$450.85	$454.78	$449.60	$447.43	$432.68	$438.29
Help wanted advertising-Chicago (1969 = 100)[c]	16.50	120	120	111	105	103	101
Help wanted advertising-St. Louis (1969 = 100)[c]	−1.54	64	68	63	63	65	70
Retail sales (in millions)[d]	−3.57	$5,532	$6,163	$6,184	$6,082	$5,737	$5,736
Coal production (in thousands of tons)	−6.13	4088	4,979	4,664	5,457	4,355	5,325
Petroleum products (in thousands of barrels)[b]	−9.42	2030	1,980	1,990	2,000	2,241	2,201
Vendor performance[e]	14.81	62%	57%	60%	57%	54.0%	50.0%
Building permits (in thousands)							
Residential housing units	−10.38	4.474	5.101	5.095	4.624	4.992	5.141
Value of residential housing	−0.81	$342,356	$391,383	$361,550	$384,791	$345,144	$320,542
Value of nonresidential construction							
Industrial buildings	−51.79	$17,697	$26,543	$28,477	$37,927	$36,706	$27,825
Office, banks, and professional buildings	25.07	$41,298	$66,837	$40,327	$46,810	$33,019	$38,042
Stores and other mercantile buildings	20.66	$50,338	$36,555	$40,746	$26,679	$41,720	$31,538
Other	52.98	$8,567	$7,542	$5,681	$5,661	$5,600	$7,953
Consumer price index (December 1977 = 100)							
North Central US[f]	3.58	182.6	182.4	180.8	180.4	—	176.1
North Central-population more than 1,200,000[f]	3.49	186.9	186.6	184.5	184.0	−−	180.3
North Central-population 360,000 to 1,200,000[f]	3.50	180.2	180.2	179.5	179.5	—	174.1
North Central-population 50,000 to 360,000[f]	4.16	178.2	177.8	176.9	176.1	—	170.7
North Central-population less than 50,000[f]	2.80	176.7	176.1	174.9	174.6	—	171.3
Chicago (1967 = 100)	4.53	346.1	345.0	338.4	337.1	331.1	330.4
St. Louis (1967 = 100)	2.79	334.7	—	330.5	—	325.6	—
		1987.I	1986.IV	1986.III	1986.II	1986.I	1985.IV
Personal income (in millions)[b,g,h]	5.97	$184,404	$180,304	$179,096	$179,622	$174,013	$173,178
Per capita personal income[b,g,h]	5.35	$15,856	$15,527	$15,445	$15,029	$15,051	$15,001

[a]Represents absolute change (percent change not relevant) [b]Recent month is preliminary figure [c]The Conference Board, *Help Wanted Advertising*, July 1987. [d]Latest month projected by BEBR. [e]Percentage of companies receiving slower deliveries. [f]Percent change between June 1986 and June 1987. [g]Seasonally adjusted at annual rates. [h]Percent change between 1986.I and 1987.I

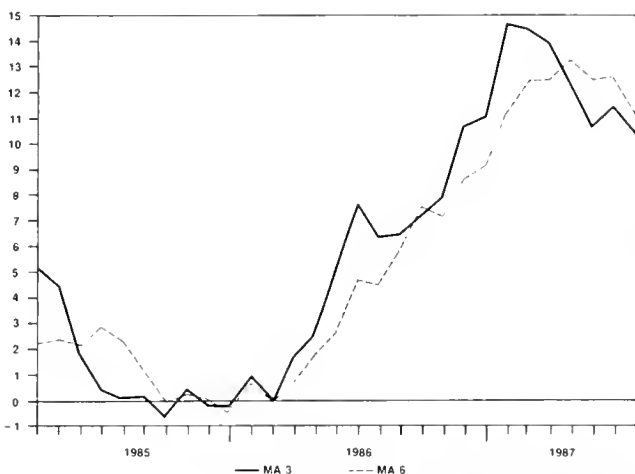**Chart 1. Composite Leading Indicator (average percent change in base indexes)**

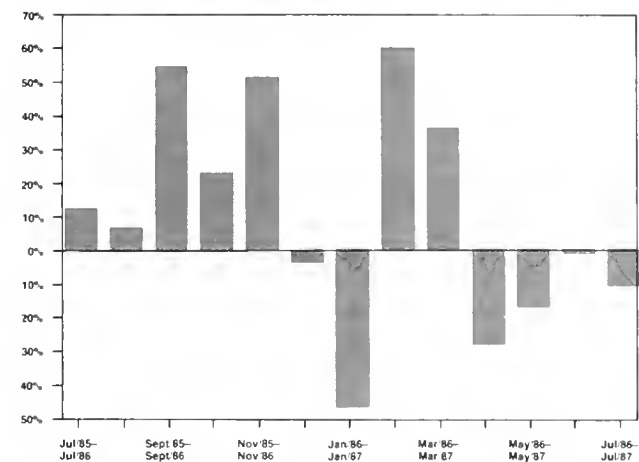**Chart 2. Year-to-Year Percent Change in Housing Permits**

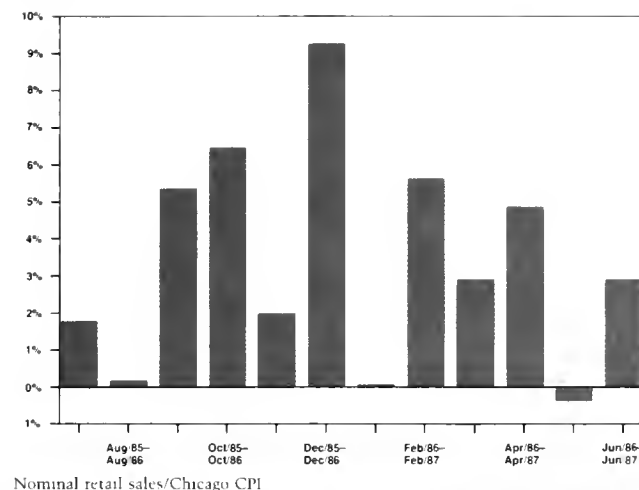**Chart 3. Year-to-Year Percent Change in Real Retail Sales***

Nominal retail sales/Chicago CPI

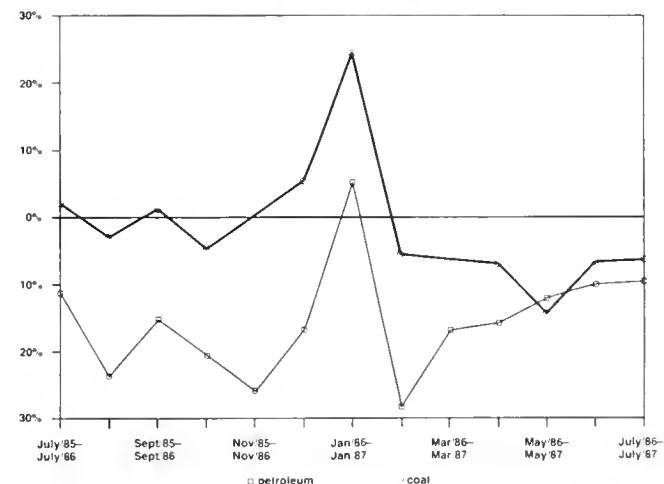**Chart 4. Year-to-Year Changes in Coal and Petroleum Production**

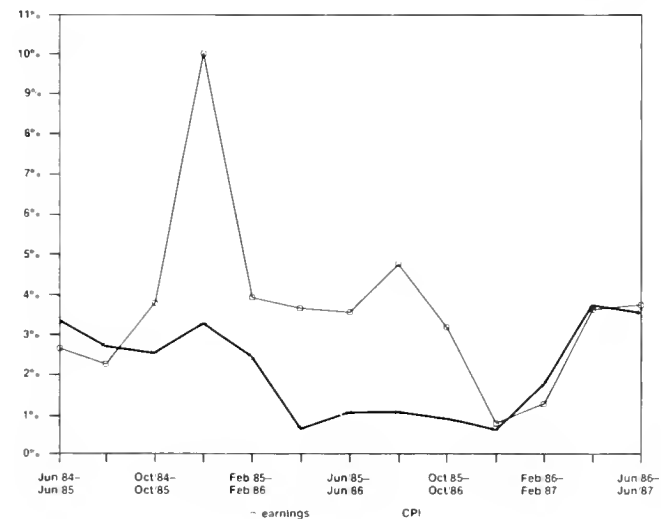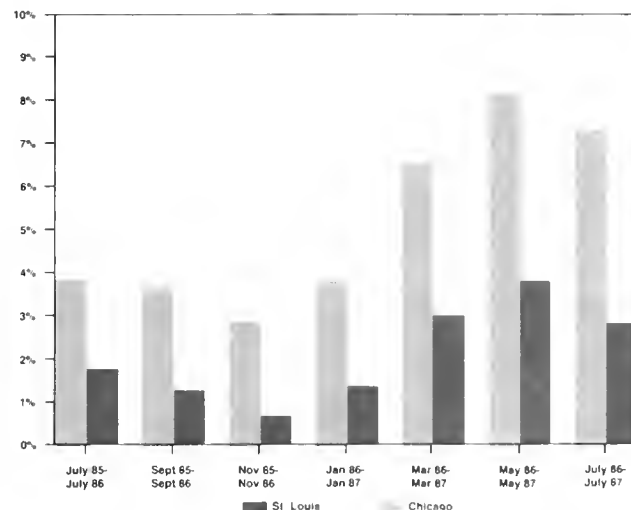**Chart 5. Year-to-Year Changes in Manufacturing Earnings and North Central CPI**

Chart 6. Year-to-Year Changes in St. Louis and Chicago CPI

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Illinois
Business
Review

Bureau of Economic and Business Research

428 Commerce West, 1206 South Sixth Street

Champaign, Illinois 61820

Illinois Economic Outlook

Illinois Seasonally Adjusted Employment

	History				Forecast			
	86:III	86:IV	87:I	87:II	87:III	87:IV	88:I	88:II
Total private nonfarm (thousands)	4,109	4,116	4,055	4,123	4,129	4,135	4,138	4,142
Mining	25	25	24	24	24	23	23	22
Construction	179	182	183	175	172	169	167	165
Manufacturing	920	924	928	925	915	908	898	891
Durable manufacturing	563	563	564	561	551	544	535	528
Primary metals	55	55	55	55	54	54	53	53
Fabricated metals	111	111	111	111	109	108	107	105
Nonelectrical machinery	137	137	138	138	135	132	129	128
Electrical equipment	118	118	118	118	115	112	109	107
Miscellaneous durables	143	142	142	139	138	138	136	135
Nondurable manufacturing	357	355	364	364	364	364	363	363
Food products	89	90	92	92	92	91	91	90
Printing and publishing	105	105	107	107	107	107	106	107
Chemicals	56	56	57	57	58	58	58	59
Miscellaneous nondurables	107	108	109	109	108	108	108	107
Utilities and transportation	278	278	280	283	279	277	274	272
Wholesale and retail trade	1,182	1,197	1,210	1,220	1,230	1,237	1,243	1,247
Services	1,133	1,137	1,138	1,145	1,153	1,162	1,171	1,180
Finance, insurance, and real estate	348	350	351	352	355	359	362	366

Bureau of Economic and Business Research

The Illinois Econometric Model predicts modest growth in employment in the state over the forecast period. During 1987 the most rapid growth is expected to occur in the wholesale and retail trades (3.08 percent), followed by services (1.55 percent) and the financial sector (1.53 percent). The state's manufacturing employment is expected to show a slight overall decline (−0.12 percent) with a fall in durable goods jobs balanced by an increase in employment in nondurable goods. Quarterly changes in employment for the largest sectors of the Illinois economy are illustrated by the accompanying graph. The trend toward a shrinking manufacturing sector is evident, with negative growth predicted throughout the forecast period. At the same time, continued increases in the remaining sectors are expected to result in job growth in the total economy.

Illinois Employment (percentage change from previous quarter)

330.5
IL
44:6 1987 COPY 5

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Business

Review

WILLIAM R. BRYAN

Perspectives on the Federal Debt: 1791–1987

The federal debt has risen substantially during the
period since 1974, having reached nearly $2.4 trillion
by the end of the fiscal year just completed. The series
of very large deficits since 1974 has added just under
$2 trillion to the federal debt. In popular discussions of
these deficits, it has become common to observe that
they exceed the cumulative deficits of the preceding
183 years of the nation's history.

The purpose of this article is to place the recent
growth of the federal debt into historical perspective.
Although there can be no doubt about the facts relating
to the federal debt, there is considerable question about
what those facts mean. It is of interest, for example, to
question whether the experience of the current decade
is unusual. Is it unprecedented? Does it represent a
marked departure from historical trends?

Deficits and Debt

A deficit or surplus emerges by virtue of a difference
between spending and income during some period of
time. To the extent that spending exceeds income,
there is a deficit; to the extent that income exceeds
spending, there is a surplus.

The concepts of debt and deficit are related. One
means by which a household, business firm, or
government is able to finance a deficit is by borrowing.
That is, it exchanges a promise to pay for the means of
payment needed to finance its deficit. In the process,
depending upon the nature of the expenditure being
financed, there can be a decline in the net worth of the
entity involved. If the deficit emerges by virtue of the
purchase of an asset, net worth may not be impaired.
If consumption is financed, net worth declines.

There is an important point to be made. Namely, in
dealing with individuals and business firms there is no
unambiguous interpretation that can be placed on the
expansion or contraction of the quantity of their
outstanding debt. An expanding debt may reflect
persistent deficits, or it may reflect a rearrangement in,
or an expansion of, assets.

In their accounting practices, private businesses seek
to recognize this distinction. Even though they may
make very large outlays on building or other capital
equipment during a year, they do not show all of those
expenses on their books during that year. Instead, on
their balance sheet they show increases in both their
assets and their liabilities. Subsequently, on their
income statement they allocate those expenses over
many years as the capital depreciates.

Not so for the federal government. The United States
government records all of its expenses for capital
expenditures in the year during which the actual

outlays occur. Thus, for example, if the US Navy takes delivery of an aircraft carrier during the fiscal year ending in 1988, all the expenses for that carrier are shown on the books of the government during that single year—even though the carrier may be in the fleet for thirty years. Consequently, for the most part the federal debt is the year-after-year accumulation of current account deficits and surpluses.

There are other important alternatives among current account budget concepts. One way of defining federal budget outlays and receipts, referred to as the total budget, places emphasis upon being all-embracing. Outlays are defined as including transfer payments and lending, in addition to expenditures for currently produced goods and services. Receipts within this framework include loan repayments, social security contributions, as well as tax revenues. In contrast, the national income accounts budget uses a second way of defining federal outlays and receipts. Federal expenditures are limited to expenditures for goods and services; receipts are limited to tax revenues from current income.

Differences between annual deficits measured within these alternative budget concepts can be quite large, or quite small. In fiscal 1980 the total budget deficit was 46.4 percent larger than the national income accounts measure, $73.8 billion compared with $50.4 billion. By comparison, the total deficit in fiscal 1986 was only 4.7 percent larger than the income accounts budget. Moreover, the total deficit may be smaller than the national income accounts deficit. For example, in fiscal 1987 the total deficit was $12.7 billion smaller than the income accounts deficit, according to the available estimates at this writing. Indeed, it is possible for one measure to be in deficit while the other is in surplus.

History of the Debt

Arguments relating to deficits and debt have persisted throughout the nation's history. A major issue associated with the ratification of the Constitution was whether the debt connected with financing the Revolution would be paid by the new central government. At length, the debt was "funded."

Chart 1 shows the outstanding federal debt for the period from 1800 to 1986. The vertical axis of Chart 1 is scaled logarithmically. With such a scale, identical percentage increases show identical vertical movements, even though absolute amounts may be quite different. On such a chart, an increase from 5 to 10 would look to be the same size as an increase from 50 to 100 or 500 to 1,000. Such a representation of data is generally considered to be appropriate for viewing developments relating to growth over long periods of time.

The nation came into being with a debt of $75.5 million. Indebtedness moved irregularly downward until the War of 1812, then rose again. Following the war, steady progress was made toward repaying the debt. With the election of Andrew Jackson, debt repayment efforts intensified. Indeed, by 1835 the

Chart 1. Public Debt of the Federal Government: 1791–1986
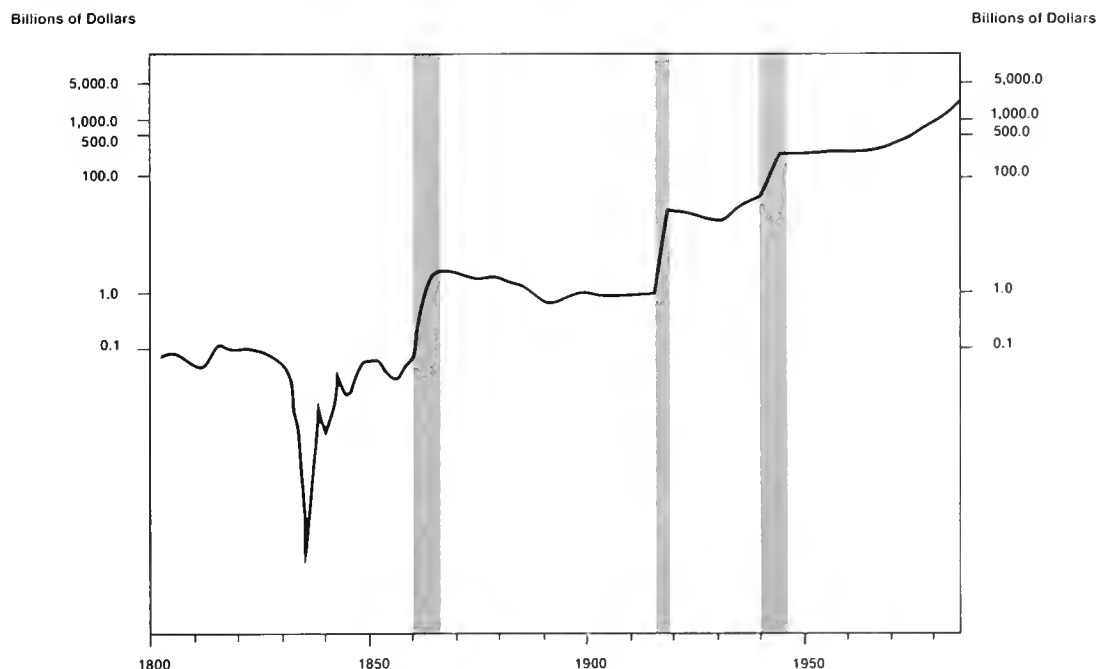
Note: For period 1791 to 1852 the statistics represent the total public debt, the formal funded debt of the federal government (including some obligations that bear no interest and matured debt upon which interest had ceased). After 1852, noninterest-bearing debt and matured debt are removed from the series. The public debt includes a small amount of obligation not subject to the statutory debt ceiling, thereby differing from the legally defined gross federal debt. For 1791 to 1842 the statistics relate to January 1; from 1842 to 1976 they relate to June 30; beginning in 1977 the fiscal year ends September 30.

3

United States was essentially out of debt.

There have been large increases in debt associated with each, or nearly each, of the nation's wars (see shaded areas of Chart 1). During and immediately following the Civil War, the debt rose from $64.7 million in 1860 to $2.2 billion in 1866, an increase of 3,350 percent. Never before had federal indebtedness come remotely close to $1 billion. As Chart 1 illustrates, the Civil War experience constituted a major change in the position of federal indebtedness. Additional imagery is provided by Chart 2A. The total indebtedness from 1791 to 1860 is shown in the shaded area. In the following six years the debt exploded. Thereafter, indebtedness tended to move downward, reaching a low of $581 million in 1892.

There was another major upsurge in federal indebtedness as a consequence of World War I. In 1916, prior to US entrance into hostilities, the federal debt stood at $973.6 million, having been cut nearly 60 percent below its Civil War peak. But during the next three years, the federal debt surged to $25.2 billion, an increase of nearly 2,400 percent (Chart 1). Here again, financial markets accommodated a major increase in quantities of debt issues by the US Treasury. Chart 2B suggests that the World War I experience was similar to experience during the Civil War. The accumulation of debt from 1791 to 1916 constituted only 2.4 percent of the 1919 debt level. After the war, there were substantial debt reductions. By 1930 the debt had fallen more than one-third, reaching $15.9 billion just prior to the Great Depression.

During the 1930s the debt expanded rapidly (at a 10.3 percent average annual rate), reaching $42.4 billion in 1940.

World War II was accompanied by a huge increase in the federal debt, if viewed within ordinary terms of reference. Roughly $230 billion were added to federal indebtedness from 1940 to 1946, more than a fivefold

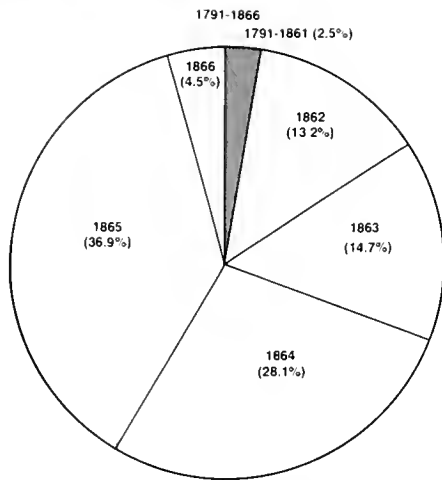## Chart 2. Debt Accumulations

Chart 2A. Civil War
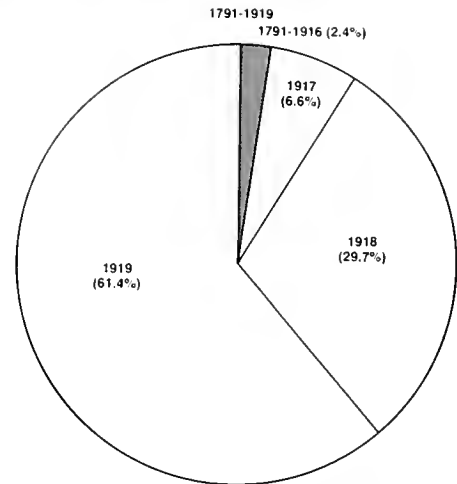

Chart 2B. World War I
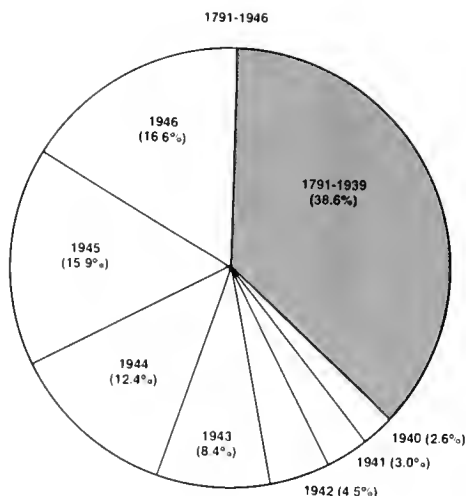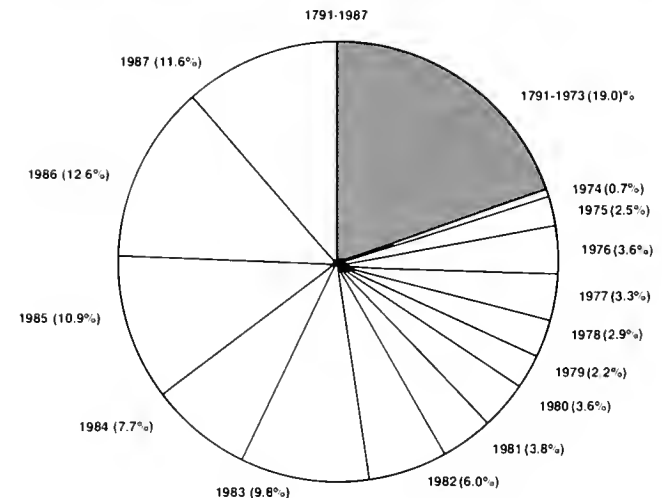

Chart 2C. World War II

Chart 2D. Since 1974

expansion. Thus, even though Chart 1 suggests that the increase was not as large as during the Civil War and World War I, it was substantially larger in dollar amounts.

The World War II experience again illustrates a persistent problem in interpreting the impact of change on, or within, a growing organization. Following World War II, it was possible to observe that the accumulation of debt during the preceding six years was massively in excess of the total indebtedness that had accumulated during the preceding 155 years of the nation's history. In fact, it was five times greater. Although such a statement has a dramatic impact, it is not really extraordinary, as indicated by comparing Chart 2C with 2A and 2B. Following World War I it could be said that the preceding three years had witnessed a growth in debt that was nearly 25 times greater than had been accumulated in the preceding 128 years of the nation's history. Following the Civil War, it could be said that the preceding six years had witnessed a growth in debt that was nearly 35 times greater than had been accumulated during the preceding 75 years of the nation's history.

Since the end of World War II, the federal debt has moved steadily upward, registering only five small reductions after 1946. The postwar period can be divided meaningfully into two subperiods. The first period consists of the 28 years from 1946 to 1974. In terms of absolute amounts, the federal debt rose from $268.1 billion to $532.1 billion, an average annual rate of increase of 2.48 percent.

The second period runs from 1974 to the present. The federal debt has expanded $1.9 trillion, having risen more than 400 percent (an annual rate of growth of 13.2 percent). As indicated, the accumulation of debt in the past 13 years has surpassed the debt increases of the preceding 183 years (Chart 2D).

For those interested in political comparisons, it turns out that the first seven years of the Reagan Administration have been impressive in terms of its ability to generate debt. Beginning with a debt of $996.5 billion at the end of fiscal 1981, the debt has more than doubled (see the table). In the four-year Carter Administration the debt rose by more than one-third, and in the Nixon-Ford Administrations the debt nearly doubled. The doubling period, the period of time required for anything to double (see insert), has shortened in each of the preceding three administrations. From 8.1 years in the Nixon-Ford Administrations, it fell to 7.8 years in the Carter Administration. In the Reagan Administration it has shortened to 5.6 years (see the table).

Experience during these administrations was markedly different from that in earlier administrations. At the rate of debt growth during the Eisenhower era, it would have taken 70 years for the debt to double. The doubling period was 26.7 years during the Kennedy-Johnson period (see the table).

Other Measures of the Size of the Debt

It is of interest to compare the debt with other relevant variables. There is a view that it is relevant to

Debt Growth during Presidential Administrations

Presidential Administrations	Outstanding Amounts* ($billions)	Debt Accumulation (percent)		Doubling Periods (years)
		Prior	During	
Eisenhower (1954–1961)	285.7	92.4	7.6	70.1
Kennedy-Johnson (1962–1969)	351.7	81.2	18.8	26.7
Nixon-Ford (1970–1977)	697.6	50.4	49.6	8.1
Carter (1978–1981)	996.5	70.0	30.0	7.8
Reagan (1982–1987)	2,372.0	42.0	58.0	5.6

*Outstanding amounts are as of the terminal year shown.

Rule of 70

The years required for any number to double can be approximated by dividing 70 by the rate of growth (treated as a whole number). For example, if there is a 10 percent rate of growth, the doubling period is approximately seven years (70/10 = 7); for a 5 percent rate of growth the doubling period is roughly 14 years (70/5 = 14).

The rule can be explained in at least two ways:

With continuous compounding:

$$2x = x\,e^{gn}$$
$$\ln 2 = gn$$
$$n = \ln 2/g;$$

where:

x = initial amount, $e \approx 2.7183$ g = growth rate, n = number of years, and ln = natural logarithm.

At a 10 percent rate of growth, the doubling period is 6.93 years (.69315/.1 = 6.931). At a 5 percent rate, the doubling period is 13.86 years (.69315/.05 = 13.8628).

With discrete annual compounding:

$$2x = x(1+g)^n$$
$$\ln 2 = n\,\ln(1+g)$$
$$n = \ln 2/\ln(1+g)$$

At a 10 percent rate of growth, the doubling period is 7.27 years (.69315/.09531 = 7.2725). At a 5 percent rate, the doubling period is 14.21 years (.69315/.04879 = 14.2067).

For many purposes, the Rule of 70 gives a useful approximation. If greater accuracy is required, the selection of procedure depends upon the nature of the growth process being considered.

relate the size of the debt to total income. According to this view, the payment of interest on the debt and the ultimate repayment of principal depend upon the stream of income out of which that debt will be serviced. In applying this type of thinking to the consumer sector, it is common to relate outstanding consumer indebtedness to after-tax income or, alternatively, to personal income. In the matter at hand, two measures are represented. One measure of debt burden is provided by the relation between the federal

debt and federal receipts. A second measure is the ratio of debt to gross national product (GNP).

Each measure tells the same story. The burden of the debt reached its peak during World War II, then drifted downward through much of the 1970s (see Chart 3). The debt burden has risen during the 1980s.

There are no magic numbers to indicate the point at which the burden of the debt begins to inhibit the economy. In World War II the size of the debt exceeded GNP by one-fifth and exceeded federal receipts by a multiple of six. For the bulk of the next four decades the debt burden declined. By 1980, the ratio of debt to GNP had fallen to less than one-third; the debt relative to federal receipts had declined to a multiple of 1.6 to 1.

Concluding Remarks

The federal debt has risen more rapidly during the period since 1974 than during other peacetime periods of this century. It has expanded particularly rapidly since the early 1980s. An aspect of the accelerated growth in debt is that the doubling period has shortened markedly.

Even so, there is no reason to regard the decade of the 1980s as a disturbingly marked departure from the nation's history. There is every reasonable presumption that the recent and current growth in the federal debt will be accommodated into investor portfolios without difficulties. After all, there have been many episodes during which rapid debt accelerations have been handled without memorable strain. Moreover, although the burden of the debt has increased moderately during the 1980s, there is no reason to suppose that the current burden is uncomfortable.

Nor should we be distracted by observations to the effect that there has been an explosion in debt. We need not be concerned by the fact that some desirable, or undesirable, variable has doubled in the recent past. One of the troublesome concomitants of inflation is that there is an abundance of nonsmall rates of growth in magnitudes measured in dollars. As a consequence, doubling periods shorten substantially. Unless there is a return to rates of inflation that had characterized the 1950–1970 period, as the world unfolds over the next several decades we will again be in a position to look back and observe that the recent past has duplicated all of the nation's history. Such a state of affairs enables us to persist in the impression that the cutting edge of life experience through which we are moving is characterized by unprecedented change. It freshens the illusion that we are special. And in many ways it is always true.

Chart 3. Measures of Debt Burden
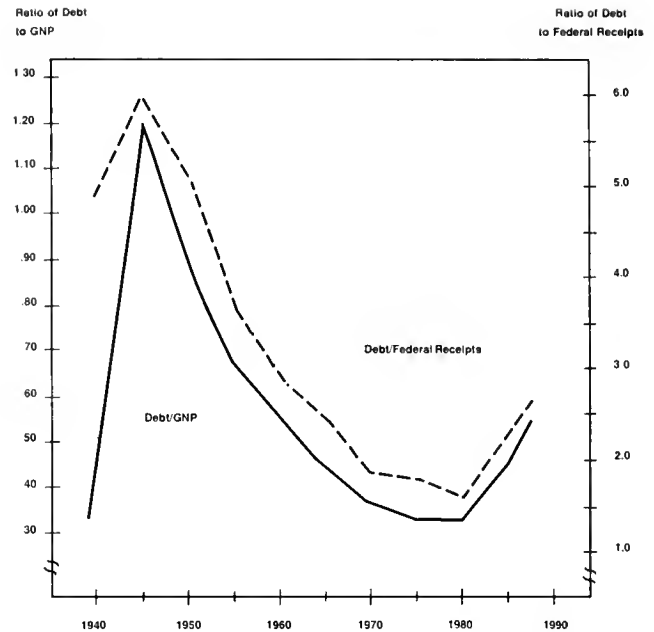
MONA J. GARDNER, HAN BIN KANG, AND DIXIE
L. MILLS

Japan, USA: The Impact of the Diamond Star Plant on the Bloomington-Normal Economy and Housing Market

Recently, several Japanese corporations have elected to manufacture and/or assemble products in the United States. The impact of these decisions has been a subject of considerable interest, especially in view of the financial incentives many state and local governments have extended to the Japanese firms. An opportunity to study selected economic effects of what *Business Week* recently called the "Japan USA" phenomenon arose after April 1985, when Chrysler Corporation and Mitsubishi Motor Corporation jointly agreed to build an automobile plant in the United States. On 7 October 1985, Bloomington-Normal, Illinois was officially announced as the plant site for the new Diamond Star Motors.

Although Bloomington-Normal itself has enjoyed a relatively stable economy, much of Central Illinois has experienced high unemployment and declining growth in recent years. Many saw the Diamond Star plant as the beginning of an economic renaissance, and Chrysler and Mitsubishi officials actively promoted that belief. Initially, they announced that the plant would have a capacity of 180,000 cars annually, produced by 2,500 workers. Even before the groundbreaking ceremony in April 1986, the announced annual capacity was increased to 240,000 cars, to be produced by 2,900 workers. The plant has a projected cost of $700 million, of which $100 million are to be paid as wages during construction.

State and local government officials echoed the belief that the plant would be of significant economic benefit to the area. In fact, governmental units provided $88.2 million in financial incentives to Chrysler and Mitsubishi to lure the Diamond Star plant to Illinois. Such incentives included investment tax credits, state sales tax credits, income tax deductions, reductions in local tax obligations, reductions in filing and permit fees, and subsidies for land purchase and building demolition. The Diamond Star plant will receive these benefits for 10 years.

In response to charges by some taxpayers that the incentives were too generous, government officials justified their actions with consultants' projections that the new plant would result in substantial economic and financial development in the community and surrounding areas. Estimates of up to 8,500 new jobs, accompanied by increases in personal income, when the plant reaches full capacity have been widely quoted. Local officials stressed the "just-in-time" inventory-management practices of Japanese

manufacturers and predicted that most suppliers for the plant would be located within a few miles of Bloomington-Normal.[1]

Measuring the Economic Impact

The purpose of our research was to begin analyzing trends in housing values, employment by sector, income, population, and other variables to determine whether the projected economic benefits of the Diamond Star plant have begun to be realized. The findings reported here are based on data spanning the period January 1982 through early 1987, representing two phases in Diamond Star history: a 3-1/2 year period *before* the Diamond Star announcement (1982 to late 1985) and the period following the announcement of the plant in which construction of the plant and hiring of workers began (late 1985 to early 1987). All conclusions drawn are preliminary, of course, because the full economic significance of the Chrysler-Mitsubishi investment will not be apparent for some time. The long-run research plan includes a comparison of economic conditions during the construction and initial operating stages (late 1985–1990) with the economic data gathered for the earlier period.

To assess the condition of the residential real estate market, monthly data on residential property sales and building permits were obtained. In addition, with the financial assistance of the Office of Real Estate Research at the University of Illinois and the cooperation of the Bloomington/Normal Board of Realtors, Multiple Listing Service (MLS) data on over 1,600 single-family home sales in the Diamond Star area were collected. To assess other economic conditions, data were gathered on unemployment rates, employment in manufacturing, construction, service and other nonagricultural jobs in both the public and private sectors, commercial bank deposits and loans, and state sales tax receipts.

An effort was made to control for external influences, such as changes in the state economy or other sources of growth or decline in the local economy. Unfortunately, of course, a clear separation of Diamond Star from other events is impossible. But reasonable control was accomplished by collecting data on another region for comparison. Thus, all comparable data were gathered for Champaign County, and most were also gathered for the state as a whole. The Champaign-Urbana area represents an excellent comparison to McLean County and Bloomington-Normal because of the similar size, location, and employment mix.

For each category of data, relative ratios and/or percentage changes over time were constructed. For example, McLean County construction employment was expressed as a percentage of total construction employment in the state of Illinois, and as a percentage of construction employment in the Champaign/Urbana area. The trend in each McLean County ratio before and after several key dates in Diamond Star history was examined to reveal whether any impact on the McLean County economy has yet been realized.

Findings

Results of the analyses are presented first for residential housing price indexes in Bloomington-Normal and Champaign-Urbana over the period 1982–1986, and then for other economic variables.

Residential Housing Prices

To assess conditions in the real estate market, a semi-annual housing price index for each area was constructed. The McLean County data consisted of a random sample of 1,619 single-family home sales reported in the annual sales book of the local Multiple Listing Service (MLS) during a five-year period from January 1982 to December 1986. The data for Champaign were drawn from house sales in the southwest quadrant of the city, with a total sample of 480 sales over the same five-year period.

The results of the regression analysis are illustrated in Chart 1. A comparison of housing price indexes for the two counties over the period 1982–1986 reveals that, although the relationship is unstable during the early part of the period, an upward trend began in the first half of 1985 and continued uninterrupted through year-end 1986. These results do not point to a definite conclusion that the new automobile plant has had a relatively positive impact on the Bloomington-Normal real estate market, although they are suggestive. The full impact of the Diamond Star plant on the local housing market will not be determined until the plant begins operating at full capacity in 1990.

Chart 1. Ratio of Housing Price Index (Bloomington over Champaign)
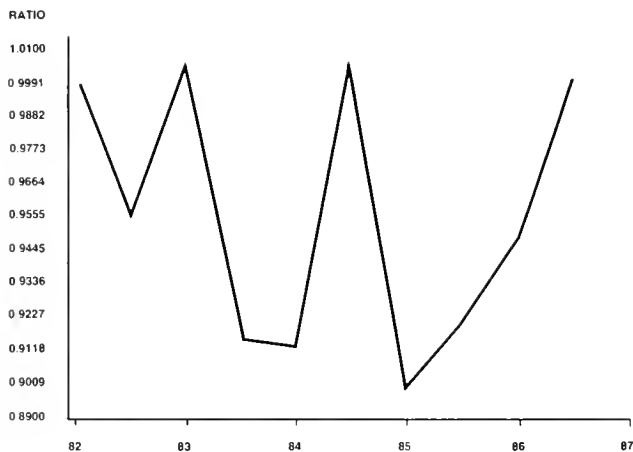

Other Economic Variables

Analyses of relative ratios and percentage changes for other economic variables suggest trends.

Building Permits. Chart 2 shows the ratio of quarterly totals for one-to-four family building permits in the Bloomington-Normal area to quarterly totals in the Champaign-Urbana area plotted over time. Over the period of study, the number of 1-to-4 family building permits issued in Bloomington-Normal relative to those issued in Champaign-Urbana increased. This

**Chart 2. Building Permits (quarterly totals)**
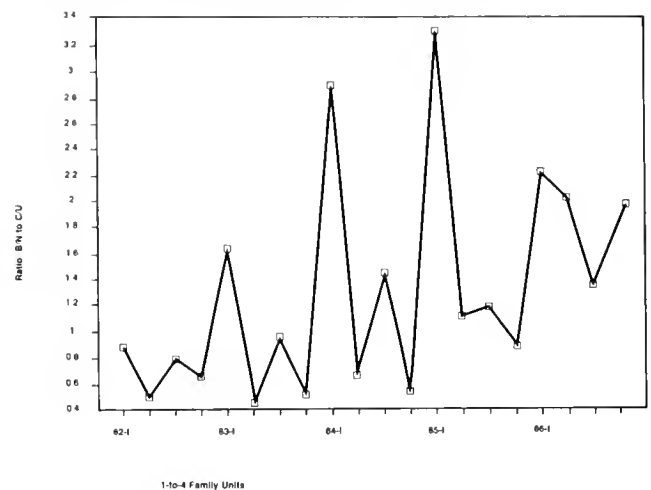
1-to-4 Family Units

strengthening in Bloomington-Normal building permits coincided with the upward trend found in Bloomington-Normal's relative housing price index. In contrast, the Bloomington-Normal ratio of permits for five-or-more family units, not shown here, did not increase, nor did quarterly *percentage changes* in building permits issued over the period.

Employment by Sector. Because many of the economic benefits of the Diamond Star plant are projected to be the result of increased employment opportunities, considerable effort was devoted to analyzing employment by sector in Bloomington-Normal relative to that in the Champaign-Urbana and in the state of Illinois.

One would not expect large increases in manufacturing employment at this stage of the Diamond Star project, although increases in construction, wholesale, and retail employment might plausibly have already occurred as a result of plant construction. The ratios of construction jobs in Bloomington-Normal to those in Champaign-Urbana and to those in Illinois however, do not reveal any apparent changes following the Diamond Star announcement. A comparison of the difference in the quarterly rate of change in construction jobs between McLean County and Champaign County does indicate a slight upward trend in McLean County although the trend began before the Diamond Star announcement.

Wholesale employment in Bloomington-Normal declined considerably relative to that in Champaign-Urbana over the 1982–1986 period, and declined slightly compared to wholesale employment in the state of Illinois. Chart 3 shows, however, that quarterly percentage changes in wholesale jobs were greater in Bloomington-Normal toward the end of the period than in Champaign-Urbana. The upward trend begins in late 1985 and is consistent with the hypothesis that the Diamond Star construction has in fact stimulated business in the wholesale sector of the Bloomington-Normal economy. (Chart 3 plots the *difference* between Bloomington-Normal percentage changes and Champaign-Urbana percentage changes. Thus, values

Chart 3. Wholesale Jobs (quarterly percent change)
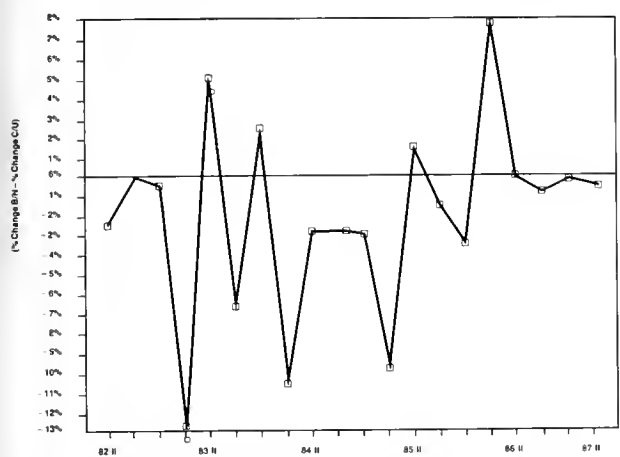
greater than 0 indicate greater rates of change in B/U than in Champaign-Urbana.)

Trends in retail employment are almost exactly opposite those in wholesale employment. While retail employment in Bloomington-Normal increased relative to that in Champaign-Urbana and in Illinois, the percentage changes were relatively lower in Bloomington-Normal following the Diamond Star announcement. The projected impact of the Diamond Star construction payroll had not translated into additional retail jobs by the end of 1986.

Unemployment. Although the Bloomington-Normal unemployment rate declined relative to Champaign-Urbana over the period 1982–1986, the decline does not coincide with the Diamond Star announcement. When compared to employment in the state, the Bloomington-Normal rate also declined slightly over the period. It is too early to tell, but late 1985 may have marked the beginning of a more pronounced decline in Bloomington-Normal's rate. This variable should be closely monitored in the future as the Diamond Star work force is brought up to full capacity.

Commercial Bank Data. Other economic variables that could potentially reveal economic changes as a result of the Diamond Star plant are total commercial bank deposits and IPC (individual, partnership, and corporate) deposits in McLean County, compared to those in Champaign County and in the state. Because data on personal income are not currently, and will probably never be, available, bank deposit data serve as reasonable proxies. Data for each six-month period from June 1982 to December 1986 indicate that both total and IPC deposits in the Diamond Star area declined over the period, despite the advent of plant construction in the latter periods.

Other banking data reveal a declining trend for total loans at commercial banks in McLean County versus those in Champaign County and in the state. After December 1985, however, the end of the six-month period in which the Diamond Star plant was announced, the declining trend in commercial and industrial loans compared to the Champaign-Urbana area was reversed. It is possible that this reversal

reflects plans for business expansion and expectations of increased economic activity in the Diamond Star region following the plant announcement. Again, this variable should be monitored closely in subsequent periods.

Sales Tax Receipts. The final data set examined was quarterly sales tax receipts for McLean County and Champaign County from January 1983 through September 1986. To ensure comparability of tax rates over the entire period, amounts collected as a result of municipal or county taxes were omitted. The data shows an increasing trend in McLean County relative to Champaign County, although it appears to have begun before the third quarter of 1985 and, thus, may not be attributable to activities surrounding the Diamond Star plant.

Future Directions

Of course, a complete assessment of the financial impact of the Diamond Star joint venture compared to the incentives extended by governmental units must await completion and full operation of the plant. It also must include analysis of additional variables such as property tax data that are not yet available. Nonetheless, this study provided an important opportunity to examine several highly visible markets with potential impact on a large number of financial decision-makers. Ultimately, the results may have implications for state and local financial incentive plans, as well as for business people, home buyers, home sellers, real estate investors, the real estate industry, and financial institutions in affected communities.

At this point, the period following the Diamond Star announcement appears to be accompanied by increases in the prices of single family housing, one-to-four family unit building permits, wholesale employment, and commercial and industrial loans in the Bloomington-Normal/McLean County area relative to the Champaign-Urbana/Champaign County area. In addition, the rate of unemployment may be decreasing relative to that in the state of Illinois, and state sales tax receipts may be increasing relative to Champaign County, although these trends began before the Diamond Star announcement. However, it is too early to measure the full impact of the plant on any of these economic variables. This is particularly true because the real estate market is traditionally considered to have a relatively slow reaction to economic changes and to new information. It is hoped that collection and analysis of data can be continued at least through 1990.

Note

[1] Subsequent events have revealed that the "just-in-time" system in the United States may be implemented somewhat differently from the way it is practiced in

Japan. By the time the Diamond Star suppliers had been announced in mid-1987, only 10 of 50 were located in Illinois. Others were as far as 400 miles from Bloomington-Normal.

MARTIN DWYER

Job Growth: A Look at Illinois and Its Counties

There is a view that Illinois has been lagging behind other states in its ability to increase employment in manufacturing or through attracting new business. With this in mind, it would be of interest to examine the recent history of Illinois employment. Such an examination may help to explain Illinois' lack of growth. In particular, it would be useful to identify the industries that have excelled in Illinois during this period, along with the regions that have grown most rapidly or deteriorated most drastically. It is also important to identify the factors that have been prominent in affecting the employment growth in particular regions.

The regional breakdown considered here involves separating the state of Illinois into counties. Once employment growth has been broken down to this regional level using the shift-share technique, factors contributing to each county's ability to increase employment are considered.

The first section presents a brief explanation of the shift-share technique. The second analyzes growth across certain manufacturing and service industries. The third examines the regional breakdown by county, setting forth a ranking of counties in terms of their "comparative advantage" in increasing employment. The fourth section identifies factors contributing to a county's comparative advantage. The analysis covers data spanning 1976–1983, sufficiently large to encompass a complete Illinois business cycle. Conclusions are presented in the final section.

The Shift-Share Technique

Shift-share analysis is a widely used technique by which employment gains or losses may be analyzed. Within the framework of this analysis, regional employment changes can be attributed to three distinct components. The first relates to the overall growth in the state; a second concerns differential growth rates across industries; and the third may be attributed to a unique set of characteristics possessed by that region. This third component of growth has come to be known as the region's "comparative advantage."

The shift-share technique can be illustrated by an example. Consider Peoria County located in Central Illinois. The breakdown of the employment gain for Peoria County from 1976 to 1983 is given in Table 1. Peoria County lost a total of 11,610 jobs due to its comparative (dis)advantage. However, the overall Illinois employment growth of 1.28 percent provided for an additional 1,360 jobs to be generated in the county. Manufacturing and services employment are shown in order to identify the amount of employment

Table 1. Breakdown of Job Gains (or Losses) for Peoria County (in thousands of jobs), 1976–1983

	Total Employment	Manufacturing Employment	Services Employment
Gain (or loss) due to:	−10.25	−8.47	3.26
Comparative advantage:	−11.61	−3.64	−3.68
Illinois growth:	1.36	0.29	0.33
Industrial mix:	0.00	−5.12	6.61

growth attributable to industrial mix in a particular region. In manufacturing, Peoria County lost a total of 8,470 jobs (of over 22 thousand in 1976). Only 3,640 jobs lost can be attributed to the environment for manufacturing in Peoria County itself (the county's comparative disadvantage in manufacturing). The remaining jobs lost in manufacturing can be attributed to the difficulties faced by the overall industry. For the service industries, Peoria County's comparative disadvantage would have called for a job loss of 3,680 jobs, only partially offsetting the overall growth of the service sector that would have provided 6,610 new jobs for the county.

A Shift-Share Look at Manufacturing and Services

The largest losses in Illinois employment in manufacturing from 1977 to 1982 were in the primary and fabricated metals industries. These industries showed a total loss of over 59,000 jobs (see Table 2), indicating that Illinois manufacturers face the same struggle as other American steel manufacturers. Thus, part of the employment loss in Illinois is attributable to an overall national trend away from production in this industry. Similarly, the heavy equipment industry in Illinois has faced major setbacks in the past from foreign competitors entering the domestic market. These developments result in the extremely large negative values on the industry mix, indicating that there would have been an employment loss in each industry in the absence of growth in the overall Illinois economy.

The difficulties in manufacturing were exacerbated in 1984–1985, as the dollar strengthened against foreign currencies. During that period, imports further strengthened and exports weakened.

The data for service industries in Illinois show strong growth. The service sector grew at a rate many times that of the overall Illinois economy, providing 169,000 jobs beyond those created as a result of growth in the Illinois economy. In the fast-growing finance, insurance, and real-estate industries, there was growth of 58,200 jobs. Of those, 53,600 can be attributed to factors other than the general growth of the Illinois economy. In the agricultural services industry only 200 of 6,500 jobs can be attributed to Illinois economic growth.

The service sector grew by 16.6 percent in Illinois compared with a 21.5 percent growth nationwide. Thus, even though the service industries in Illinois were expansive, their growth lagged behind the US figures. The manufacturing industry declined 2.5 percent nationwide, while slipping 16.2 percent in

Table 2. Employment in Illinois (in thousands) by Major Industry and Shift Share Component, 1977–1982

Industry	Illinois Growth Effect	Industrial Mix Effect
Total manufacturing	16.1	−225.1
Food and kindred products	1.2	−17.1
Primary metals industries	1.1	−30.8
Fabricated metals industries	1.7	−28.6
Electronic equipment	1.9	−27.1
Transportation equipment	0.6	−11.2
Total services	13.8	169.2
Finance, insurance, and real estate	4.6	53.6
Agricultural services, forestry and fishery, etc.	0.2	6.3

Illinois. In short, the weak industries have declined even more rapidly in Illinois than in the nation as a whole.

Rating the Counties by Comparative Advantage

The ranking of counties by various measures of comparative advantage appears in Table 3. The rankings of counties are by overall comparative advantage, comparative advantage in the manufacturing sector, and comparative advantage in the service sector. Overall comparative advantage is given by the county's ability to increase employment above the gain that would have resulted from growth in the Illinois economy. In making comparisons across counties, it is helpful to shift the analysis to a per capita basis. To accomplish this, the comparative advantage for each county is divided by the county's population, creating a measure of per capita employment gain.

No clear regional pattern emerges from the top five ranked by total comparative advantage. Three of the leading five are from metropolitan areas, while two are not. Of those counties from metropolitan areas, one is from the St. Louis area while the others are from the Chicago area (McHenry and DuPage). Four of the top five performers—McHenry, Monroe, Wabash, and Dupage—were among the top five in the rankings for the service industry. The remaining top ranking for the service industry, Schuyler County, had a ranking of only 41 in manufacturing.

Of the bottom five performers as ranked by per capita comparative advantage, there are two from metropolitan areas (Tazewell and Kendall). Alexander and Mason counties, two of the bottom five, had no service industry employment at all. In addition, Tazewell and Knox Counties were also among the bottom five in the rankings for the manufacturing industry.

Factors Contributing to Comparative Advantage

There are five potential contributors to comparative advantage: (1) labor skill, (2) public policy environment, (3) local infrastructure, (4) local market strength, and (5) local transportation and utilities environment. Using a statistical technique called regression analysis, can shed light on which of these variables has influenced employment growth during the period since 1976.

Table 3. County Ranking by Comparative Advantage (per 1,000 people), 1976–1983

County	Total	Services	Manufac-turing	County	Total	Services	Manufac-turing
DuPage	1	1	10	Marshall	52	22	21
DeWitt	2	97	26	Cook	53	58	64
Wabash	3	3	35	Pope	54	91	102
Monroe	4	4	37	Cumberland	55	98	15
McHenry	5	5	4	Iroquois	56	47	58
Lawrence	6	83	29	Clark	57	39	22
Lake	7	7	25	Mercer	58	53	47
Wayne	8	59	30	Fayette	59	79	39
Clinton	9	56	48	Carroll	60	16	18
Edwards	10	36	1	Stark	61	6	14
McLean	11	44	55	Jersey	62	85	80
White	12	33	77	Moultrie	63	73	74
Marion	13	24	7	Brown	64	101	61
Saline	14	14	59	Piatt	65	88	28
Clay	15	8	62	Bond	66	89	44
Jackson	16	31	43	Christian	67	99	85
Franklin	17	43	36	Scott	68	28	52
Jefferson	18	45	3	McDonough	69	75	49
Effingham	19	67	11	Henderson	70	42	56
Kane	20	30	31	Calhoun	71	65	53
Coles	21	32	19	Adams	72	86	38
Champaign	22	11	24	Kankakee	73	63	90
Lee	23	94	9	Warren	74	82	34
JoDavies	24	37	60	Menard	75	80	76
Grundy	25	21	65	Hamilton	76	17	84
Stephens	26	55	8	Montgomery	77	51	54
Johnson	27	26	72	Douglas	78	96	27
Schuyler	28	2	41	Woodford	79	84	46
Sangamon	29	18	82	Henry	80	77	87
Richland	30	12	100	Jasper	81	64	73
Macoupin	31	68	32	Macon	82	76	68
Will	32	13	71	LaSalle	83	62	97
St Clair	33	61	51	Ford	84	23	75
Livingston	34	48	5	Ogle	85	70	81
Putnam	35	10	6	Vermillion	86	72	83
DeKalb	36	9	40	Gallitin	87	41	67
Randolph	37	35	13	Edgar	88	74	79
Washington	38	69	66	Pulaski	89	90	63
Morgan	39	46	23	Massac	90	92	70
Winnebago	40	15	42	Pike	91	60	68
Perry	41	40	95	Peoria	92	87	91
Greene	42	54	50	Rock Island	93	78	92
Bureau	43	33	16	Fulton	94	38	98
Williams	44	20	57	Hardin	95	95	33
Cass	45	100	12	Union	96	49	86
Crawford	46	52	16	Whiteside	97	81	93
Logan	47	27	78	Mason	98	93	94
Hancock	48	57	20	Alexander	99	101	96
Boone	49	70	2	Kendall	100	66	89
Madison	50	25	88	Knox	101	50	99
Shelby	51	19	45	Tazewell	102	29	101

The skill level of the labor force, not a readily available statistic, can be approximated in two different ways. The first is the proportion of the population over age 25 with at least 12 years of education. There is a presumption that labor skill levels rise with the level of education. The data for this variable came from the 1980 Census. The second way to approximate skill level is per capita expenditure on education. Presumably, higher levels of per capita expenditure on education would lead to increases in the skill level of workers.

In either case, the impact of the skill level of labor on employment growth depends largely on the type of industry in the area. If the industrial mix requires a great deal of skilled labor, one would expect a strong positive relationship between skill level and employment growth. In contrast, if the industrial mix requires only unskilled labor, it is unlikely that an increase in the skill level would enhance employment.

To summarize the quality of the public policy environment, two measures are used. The first is per capita taxes collected at the local level; the second is per capita direct local government expenditure in the county. Theory regarding, and empirical work on, the impact of taxes on employment growth are unclear. On its face, a tax serves as a drain on the economy. However, to the extent that taxes are a prerequisite to expenditures, they can also represent a positive influence.

Two measures are used to summarize the infrastructure of the counties. The first indicates growth for those counties located in a metropolitan area. A county is considered to be in a metropolitan area if it is located in an area defined as a standard metropolitan statistical area (SMSA). It is expected that there are economic advantages to location in a metropolitan area arising by virtue of an extensive industrial base. For example, a metropolitan county such as DuPage County would already have developed an extensive sanitation system, janitorial services, and even consulting services. Such services would be

unavailable in counties such as Schuyler County in Central Illinois. The second approximation used for local infrastructure is the proportion of the county population employed in the agricultural sector. Because much of agricultural production is exported, employment in that sector is tied closely to national and international activity. Agricultural activity would be expected to offset losses in a county due to weakness in other industries.

Local market strength, or purchasing power, is measured by per capita personal income. Because a higher level of per capita personal income in an area would mean that the average consumer had a larger purchasing power, it is expected that an increase in a county's per capita personal income in 1976 would attract producers to lucrative markets, causing production and employment in the area to rise.

As the transportation and utilities expenses become higher in a given region. They are expected to act as a deterrent to production and, therefore, job growth. As a measure of transportation and utilities expense, the per capita transportation and utilities earnings is used.

Results of the Analysis

The analysis was carried out at a number of levels. First, all 102 counties were considered as a whole. Because this type of analysis might overshadow the differences between those counties with a comparative advantage and those with a comparative disadvantage, these two groups of counties were analyzed separately. The analysis was also extended to identify the factors contributing to a county's comparative advantage in services and manufacturing.

For the analysis of all counties grouped together, the findings are consistent with hypotheses relating to skill level and government policy.

However, the results of the analysis are not statistically significant. For the analysis of the counties as a total group, the results concerning factors contributing to service sector comparative advantage are more conclusive than those for total comparative advantage. Results relating to the skill level are statistically significant.The findings show that a 10 percent increase in this factor leads to an increase of 5.8 jobs in the service sector per 1,000 people in each county. In manufacturing, results relating to skill level and employment growth do not show an acceptable level of statistical significance.

Significant results emerge in the analysis separately carried out for manufacturing. Contrary to previous suggestions, the relationship between per capita direct government expenditure and manufacturing employment growth is found to be negative (and statistically significant).

Also, there was statistically significant difference in manufacturing employment growth between those counties in SMSAs and those that are not. If the county was in a SMSA, it could be expected to lose eight more jobs (per 100 people) than in the non-SMSA counties. The additional losses reflect the comparative disadvantage in manufacturing.

In order to extract additional information about job growth in Illinois, the counties with above-average performance were analyzed separately. In terms of total comparative advantage for these counties, per capita personal income was found to have a statistically significant positive influence on employment growth. A $10 increase in per capita personal income was found to lead to an increase of 20 jobs per 1,000 of population. Such results are consistent with the view that a county's purchasing power is positively related to its overall employment growth. In terms of service sector comparative advantage for these counties, the most striking result was a statistically significant positive relationship between per capita direct government expenditure and job growth. An increase of $10 in this factor was found to lead to an increase of one job for every 2,500 people in the service sector. A significant relationship was also found between service sector comparative advantage and the labor skill level. Such results are consistent with those found in the overall analysis. The infrastructure, as measured by the per capita farm employment, was found to be a statistically significant positive influence on employment growth. The positive influence of per capita farm employment is due to the fact that the agricultural sector grew nationwide at a rate faster than did the overall economy of the state.

In terms of manufacturing employment growth for those counties with a comparative advantage, the negative relationship between job growth and government expenditure was again found. There was also a statistically significant relationship between manufacturing job growth and per capita personal income. As was the case with services, in manufacturing there was a strong negative relationship between job growth and location in a SMSA. Location in an SMSA was associated with a loss of an additional 20 jobs per 100 people, compared with non-SMSA counties.

Among those counties at a comparative disadvantage, the attempts to estimate factors influencing employment growth were unsuccessful. Although the influences of factors follow the patterns indicated earlier, the only significant results are those relating to per capita personal income and per capita farm employment. Both factors exert positive influences comparable to those discussed earlier. It is expected that the counties with a comparative disadvantage have been subject to individual problems, less systematic and, therefore, less explainable by the analysis used here.

Conclusions

Employment growth in Illinois is substantially slower than in most other states. The present study presents a ranking of Illinois counties in terms of their economic performance. The measures used to rank the counties here were based on examining the employment growth in a county due to a set of characteristics unique to that county. The results of the analysis indicate that differences among Illinois counties in employment growth rates relate to such factors as labor skill level, local purchasing power, and per capita government expenditure.

Illinois Business Indexes

The underlying strength of the Illinois economy is uncertain. As shown in Chart 1, the current indicator rose above the trend indicator in August, but resumed its downward path in September. The current indicator is an average of the composite leading indicator series for the past three months. The trend indicator is the average of the composite leading indicator for the past six months. When the three month average is below the six month average, it indicates that the leading indicator series is experiencing a downward movement. Movement is considered meaningful if it lasts for four or more months.

Of the 11 components of the composite leading indicator series, five are illustrated in Charts 2 through 6. Vendor performance (Chart 2) measures the percent of businesses reporting late deliveries. As the economy moves towards full capacity, suppliers find it increasingly difficult to make timely deliveries. An

upward moving trend, therefore, would indicate the economy is moving towards full capacity. As illustrated in Chart 2, there has been an upward trend since February. Real Illinois sales tax receipts and real Illinois personal income tax receipts are proxies for real retail sales and real personal income respectively. As shown in Charts 3 and 4, both these components have remained fairly stable for the past year. Total nonagricultural employment (Chart 5) fell in September after increasing for the previous five months. Housing permits issued (Chart 6) also continued its general decline.

These series do not include October. Hence, they do not reflect the economic uncertainty that has followed the stock market crash. The future direction of the Illinois economy greatly depends upon the health of the national economy. If the national economy moves into a recessionary phase, the Illinois economy will follow.

ILLINOIS BUSINESS INDEXES

	Percent Change Sept 1986- Sept 1987	Sept 1987	Aug 1987	July 1987	June 1987	Sept 1986	Aug 1986
Leading Indicator (Current Indicator)	3.05[a]	10.49	11.68	10.38	11.49	7.44	6.49
Leading Indicator (Trend Indicator)	3.38[a]	10.92	11.06	11.19	12.55	7.54	5.92
Employment-manufacturing (in thousands)[b]	0.93	933.6	932.6	930.3	929	925.0	922.8
Average weekly hours-manufacturing[b]	-0.24	41.5	41.6	41.6	41.8	41.6	41.1
Weekly earnings-manufacturing[b]	0.97	$450.69	$453.44	$453.02	$454.78	$446.37	$440.59
Help wanted advertising-Chicago (1969 = 100)[c]	13.86	115	120	120	120	101	100
Help wanted advertising-St. Louis (1969 = 100)[c]	0.00	62	66	64	68	62	64
Retail Sales (in millions)[d]	-6.34	$5,450	$6,071	$5,953	$6,163	$5,819	$5,819
Coal production (in thousands of tons)	5.48	5,542	5,226	4,088	4,979	5,254	5,225
Petroleum products (in thousands of barrels)[b]	-13.11	1,875	1,810	2,030	1,980	2,158	2,017
Vendor performance[e]	32.69	69%	60%	62%	57%	52%	51%
Building permits (in thousands)							
Residential housing units	-44.29	3.065	4.616	4.474	5.101	5.502	4.326
Value of Residential housing	-8.00	$330,352	$318,192	$342,356	$391,383	$359,088	$296,180
Value of nonresidential construction							
Industrial buildings	-30.33	$32,512	$30,566	$17,697	$26,543	$46,663	$20,324
Office, banks, and professional buildings	167.87	$67,922	$33,539	$41,298	$66,837	$25,356	$80,030
Stores and other mercantile buildings	18.62	$51,157	$34,784	$50,338	$36,555	$43,128	$38,029
Other	11.76	$4,524	$8,677	$8,567	$7,542	$4,048	$3,276
Consumer price index (December 1977 = 100)							
North Central US[f]	4.43	184.8	184.0	182.6	182.4	—	176.2
North Central/population more than 1,200,000[f]	4.15	189.2	188.2	186.9	186.6	—	180.7
North Central/population 360,000 to 1,200,000[f]	5.51	182.4	182.0	180.2	180.2	—	172.5
North Central/population 50,000 to 360,000[f]	4.91	180.8	179.6	178.2	177.8	—	171.2
North Central/population less than 50,000[f]	3.33	176.7	177.1	176.7	176.1	—	171.4
Chicago (1967 = 100)	4.79	349.9	348.8	346.1	345.0	333.9	331.4
St. Louis (1967 = 100)	4.24	339.5	—	334.7	—	325.7	
		1987:II	1987:I	1986:IV	1986:III	1986:II	1986:I
Personal income (in millions)[b,g,h]	4.83	$188,293	$187,233	$180,304	$179,096	$179,622	$174,013
Per capita personal income[b,g,h]	7.56	$16,165	$16,099	$15,527	$15,445	$15,029	$15,051

[a]Represents absolute change (percent change not relevant). [b]Recent month is preliminary figure. [c]The Conference Board, *Help Wanted Advertising*, 19 September. [d]Latest month projected by BEBR. [e]Percentage of companies receiving slower deliveries. [f]Percent change between Aug 1986 and Aug 1987. [g]Seasonally adjusted at annual rates. [h]Percent change between 1986:2 and 1987:2.

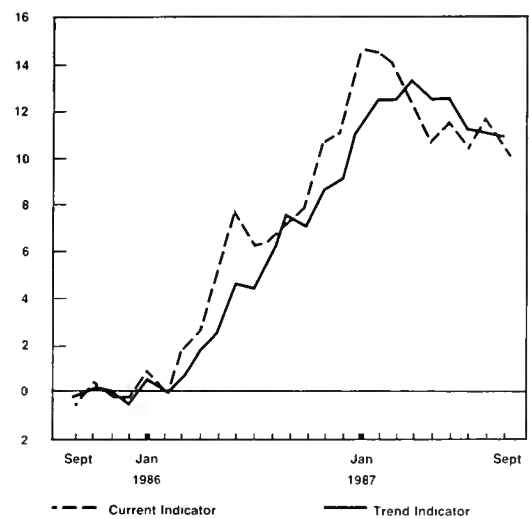**Chart 1. Composite Leading Indicator (Average Percent Change in Base Indexes)**

Current Indicator   Trend Indicator

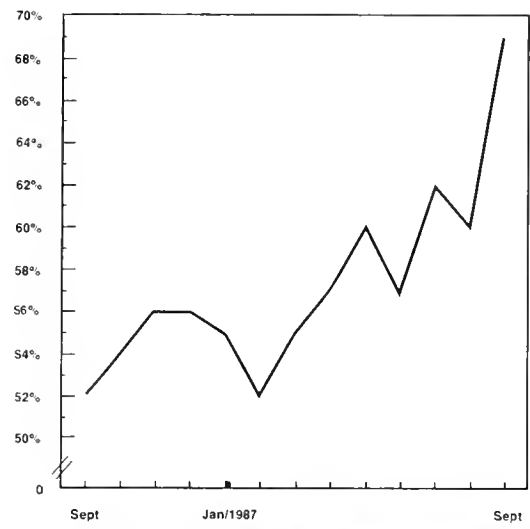**Chart 2. Vendor Performance (Seasonally Adjusted)**

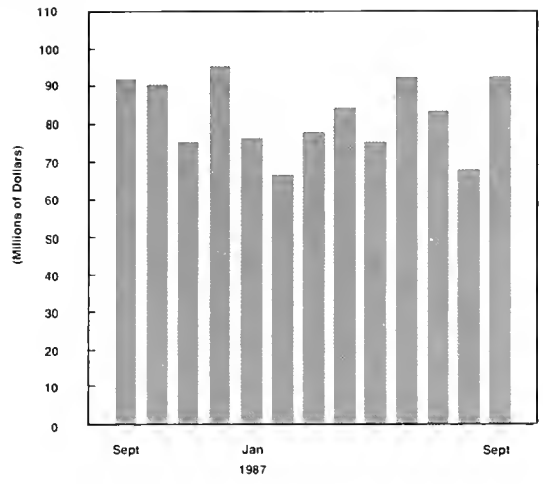**Chart 3. Real Illinois Sales Tax Receipts (Seasonally Adjusted)**

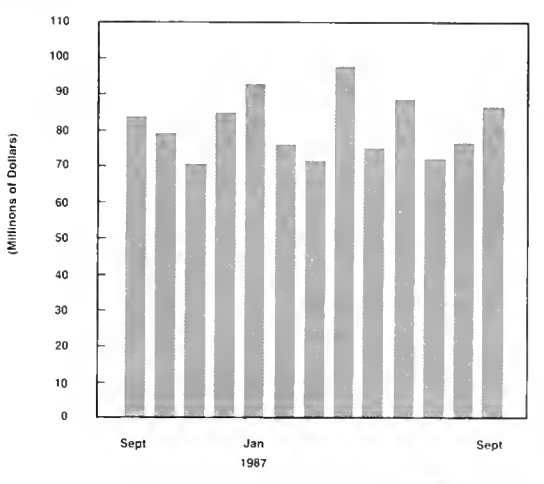**Chart 4. Real Illinois Income Tax Receipts (Seasonally Adjusted)**

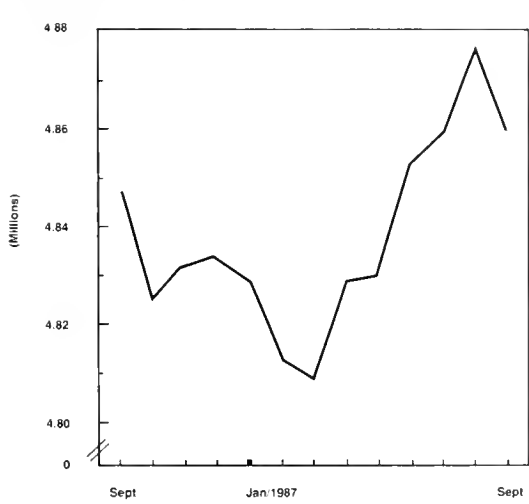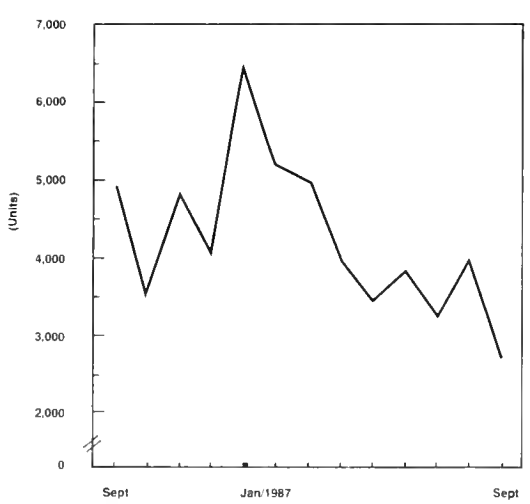**Chart 5. Total Nonagricultural Employment (Seasonally Adjusted)**

Chart 6. Housing Permits (Seasonally Adjusted)

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Illinois Economic Outlook

Illinois Personal Income (Seasonally Adjusted)

	History				Forecast			
	1986:III	1986:IV	1987:1	1987:II	1987:III	1987:IV	1988:I	1988:II
Total personal income (in millions)	$179,096	$180,309	$184,404	$187,203	$191,098	$194,254	$197,969	$201,568
Private nonfarm	114,936	116,236	118,020	119,101	120,981	122,471	124,377	126,259
Mining	1,146	1,140	1,141	1,211	1,235	1,252	1,269	1,282
Construction	8,128	8,230	8,255	8,067	8,146	8,223	8,279	8,329
Manufacturing	28,786	28,983	29,500	29,731	30,023	30,380	30,700	31,021
Durable manufacturing	18,022	18,076	18,164	18,334	18,430	18,617	18,772	18,934
Nondurable manufacturing	10,764	10,907	11,336	11,397	11,593	11,762	11,928	12,087
Utilities and transportation	10,216	10,250	10,475	10,740	10,780	10,807	10,898	10,991
Wholesale and retail trade	23,034	23,306	23,548	24,022	24,435	24,845	25,258	25,644
Finance, insurance and real estate	12,196	12,500	12,756	12,912	13,229	13,328	13,609	13,911
Services	30,935	31,334	31,836	32,419	33,132	33,635	34,363	35,081

Bureau of Economic and Business Research

Total personal income will grow 4.78 percent in 1987 and 6.85 percent in 1988 according to a forecast of the Illinois Econometric Model. Real personal income is also expected to increase, although at much more modest rates due to anticipated increases in the price level. The expansion in income is the result of steady growth in each sector of the Illinois economy as indicated by the table. During 1987 the fastest growing areas are the financial, service, and the wholesale and retail trade sectors, with increases of 9.2 percent, 5.56 percent, and 4.68 percent, respectively. Similar rates of growth are also expected in 1988. Because these areas account for over 50 percent of private, nonfarm income, growth of this kind has the most impact on the overall economy (see the chart).

Personal Income (relative share by sector)

Personal Income
relative share by sector

Other (8.4%)
Manufacturing (25.0%)
Services (27.0%)
Utilities (8.9%)
Finance (10.8%)
Wholesale/Retail (20.0%)

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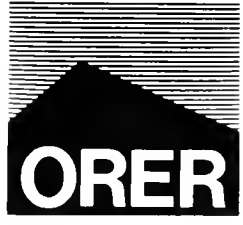
Illinois
Business

Review

ORER

JAMES R. FOLLAIN

ORER 1987

Real estate markets have become increasingly
complex in recent years. Some of the reasons for this
trend include the changing taxation of real estate, the
securitization of real estate for sale to investors, new
methods of real estate finance, and the ever present
problem of developing sound governmental policies for
the housing market. One consequence of the trend is
an increase in the demand for personnel with expertise
in real estate finance and economics; indeed, students
have responded to this demand by enrolling in real
estate courses in record numbers. Another consequence
is the demand for research about real estate markets,
especially research that makes use of the tools of
modern finance and economics. The State of Illinois
responded to these changes in 1980 by establishing the
Office of Real Estate Research (ORER), a unit within
the College of Commerce and Business Administration
at the University of Illinois, Urbana-Champaign
(UIUC). The Illinois Association of Realtors® and the
Real Estate Education Fund of Illinois (REEF) played a
major role in the establishment of ORER.

The objective of ORER is to maintain an ongoing real
estate research and education program centered at the
UIUC campus. UIUC was chosen because of its
preeminent position among public universities within
the state and its long and excellent tradition in the field
of real estate. Real estate courses have been offered
within the College of Commerce and Business
Administration at UIUC since 1955.

In some previous years, ORER has produced a booklet
describing its purpose and activities. A different
approach is used this year to convey some of the
exciting developments at ORER: an issue of the *Illinois
Business Review* devoted entirely to real estate. This
introductory article reviews the structure of ORER and
reports on its activities during 1987. The four articles
that follow are specific research papers that provide a
good flavor of the kind of work ORER supports. We
hope you like it.

Structure of ORER

ORER is led by the Director, James R. Follain, a
Professor in the Finance Department. The director
reports to Associate Dean for Academic Affairs of the
College of Commerce and Business Administration,
Jane Leuthold. In addition he works closely with the
ORER Advisory Committee. The members of the 1987
ORER Advisory Committee include:

William R. Bryan, Chair of the Department of
Finance at UIUC.

Gary Clayton, Executive Vice President, Illinois

Association of Realtors®.

Peter Colwell, ORER Professor of Real Estate and Professor of Finance at UIUC.

Robert E. Cook of Cook-Witter, Inc.

Lydia Franz, Koenig & Strey Realtors.

John Hamer, President, Hamer Holding Group.

Charles Hill, Executive Vice President, Federal Home Loan Bank of Chicago.

Jane Leuthold, Associate Dean of the College of Commerce and Business Administration, UIUC.

Terry Lutes, Illinois Association of Realtors®.

David Rittmiller, Sales Associate, Traders Realty Corp. and President of the Real Estate Education Foundation.

Ronald See, State of Illinois Real Estate Commissioner.

Several UIUC faculty are affiliated with ORER.

Jan K. Brueckner, Professor of Economics

Roger E. Cannaday, Associate Professor of Finance

Peter F. Colwell, ORER Professor

Philip J. Rushing, Adjunct Professor of Finance

Carl Webber, Adjunct Professor of Finance

ORER also employs several research assistants.

The principal financial support for ORER comes from the state's Real Estate Research and Education Fund (REREF). Revenues to REREF have been around $175,000 per year. These come from two sources: interest from the Real Estate Recovery Fund (roughly two-thirds of the revenue) and fees for real estate broker and salesperson licenses ($4 per new license or reinstatement). Revenues can vary depending upon interest rates and the number of new licensees.

ORER expenditures can be divided into three main categories: personnel, research dissemination, and research awards. Personnel expenditures include compensation for the director, the ORER Professor, the ORER secretary, and research assistants. Research dissemination expenditures include the cost of producing and distributing research papers and outlays for various seminars offered. Research awards to UIUC faculty and to other scholars, both in Illinois and around the nation comprise the remaining portion of the budget. The outlook for future budgets is discussed later in this article.

Research in 1987

The primary activity of ORER is research, especially research that analyzes the economic and financial aspects of real estate markets. Much of the research is done by academics and is ultimately published in academic and professional journals. However, a substantial effort is made to produce papers for the wider audience of real estate professionals within Illinois.

There are two main outlets for ORER research. The first is the ORER Paper Series begun in 1985. Since the inception of the series, 54 papers have been produced. Papers for 1987 include:

#41 "A Note on REITs: A Contingent Claim Analysis" by Hun Y. Park and Philip J. Rushing.

#42 "Assumption Financing: Theory and An Empirical Test" by Mark A. Sunderman, Roger E. Cannaday, and Peter F. Colwell.

#43 "Do Prices Reflect Market Fundamentals in Real Estate Markets?" by Louis O. Scott.

#44 "Occupational Change and Sex Integration in Real Estate Sales Occupations" by Barbara J. Thomas and Barbara F. Reskin.

#45 "Intrajurisdictional Tax/Benefit Capitalization: Neighborhood Effects" by Kalman Goldberg and Robert C. Scott.

#46 "Understanding the Real Estate Provisions of Tax Reform: Motivation and Impact" by James R. Follain, Patric Hendershott, and David C. Ling.

#47 "Notre Dame Avenue Apartments" by Philip J. Rushing.

#48 "Hedging Commercial Adjustable Rate Mortgages with Treasury Bond Put Options" by Richard Garrigan and Carl Luft.

#49 "Improving the Odds: Effective Salesperson Selection Via Profiling" by Mary Coveny.

#50 "The Experience of the US Secondary Mortgage Market: Born in a Regulated Environment but Flourishing in a Competitive One" by James R. Follain.

#51 "The Economics of Shopping Centers: A Literature Survey" by Kangoh Lee.

#52 "Why Do Home Ownership Rates Vary among Metropolitan Areas?" by Dixie M. Blackley and James R. Follain.

#53 "Residential Investment and Mortgage Markets" by Yoon Dokko, Robert Edelstein, and E. Scott Urdang.

#54 "Japan, USA: The Impact of the Diamond Star Plant on the Bloomington-Normal Economy and Housing Market" by Mona J. Gardner, Han Bin Kang, and Dixie L. Mills.

The second major outlet for research results is the *Illinois Business Review*, which publishes an article contributed by ORER in each issue. Most are produced as the result of ORER research awards and, as summaries of longer papers, are designed to be nontechnical presentations of interest to a wide audience within the real estate industry. ORER publications can be obtained by writing to the Office of Real Estate Research.

As noted earlier, ORER regularly awards research grants to academics and other researchers. Proposals are reviewed three times a year, in September, January, and May. Typical awards are about $5,000. Further information regarding proposals can be obtained by writing to the Director.

Highlights of 1987

Several new programs, projects, and changes occurred in 1987. This section highlights some of them.

ORER Letter.

ORER is always seeking new ways to inform the real estate community of the research being conducted. A new venture was launched this year to aid in this endeavor. The first of a series of *ORER Letters* was published in October. This eight-page publication contains a summary of an ORER research paper, an interview with Carl Webber, a new faculty member, and a variety of information about ORER and its research activities. We intend to produce several issues per year. Those wishing to be on the mailing list should write to the ORER secretary.

Gifts to ORER

Sheldon Good of Sheldon Good and Company in Chicago joined the UI Foundation's President's Council in November 1987 and designated that his $10,000 gift be used by the Office of Real Estate Research. Sheldon Good graduated from the real estate program at UIUC in 1955 and is best known for his innovations in the area of real estate auctions. Indeed, *Fortune* featured his firm in the 12 October 1987 issue.

ORER also received a $5,000 gift from the Rosenberg Real Estate Equity Fund (REEF) in December 1987. REEF is one of the largest and most respected real estate investment firms in the country. Its clients include large pension funds who desire to include real estate in their portfolios. REEF also provides a $5,000 Fellowship for graduate students interested in real estate.

Other gifts in 1987 were received from Dr. and Mrs. A. Van Tienhoven in honor of Mr. and Mrs. C. B. Younger and from Robert Levin of Wolin-Levin, Inc.

Alumni Luncheons

Two luncheons for UIUC alumni in the field of real estate were held in Chicago, one in April and one in November. At the Spring meeting, Sheldon Good spoke about real estate auctions, and Donald Rundblom, class of 1975, of Morgan Stanley in New York spoke at the Fall luncheon about Commercial Mortgage-Backed Securities. We plan to have two luncheons in 1988. Further information on luncheons and the real estate alumni mailing list should be directed to ORER.

Course Curriculum

The student demand for real estate courses remains strong. In addition to two survey courses, one at the undergraduate and one at the graduate level, courses are offered in the areas of appraisal, investment, finance, urban economics, and law. Typical enrollment in these upper-level courses is 30 or more. The University offers a B.S., M.S., and Ph.D. degrees in finance with a concentration in real estate.

Rho Epsilon and Job Candidates

Professor Roger Cannaday and the members of the Rho Epsilon Fraternity—an organization of students interested in real estate—have developed a brochure that contains biographical information about students soon to graduate. Most of these students have had several real estate courses. The majority of students will graduate in May with a B.S. in finance with a concentration in real estate, although a substantial number will be receiving an M.S. in finance or an MBA. The brochure is available upon request from ORER.

New Offices for ORER

Faculty and staff affiliated with ORER moved to a new suite of offices in 304 David Kinley Hall in August. The suite includes offices for the director, the ORER secretary, and Professors Cannaday, Colwell, Rushing, and Webber. In addition, a conference room is available. Previously, faculty associated with ORER were located throughout David Kinley Hall and Commerce West.

The new arrangement clearly identifies ORER to other faculty and, especially, to students. We are very excited about the change.

Award to Robert E. Cook

One of the people most responsible for the establishment of ORER is Robert E. Cook, currently president of Cook-Witter, Inc. Bob Cook initiated the movement to establish ORER while he was the Executive Vice President of the Illinois Association of Realtors® in the late 1970s. He served on the ORER Advisory Committee from its inception until October 1987. On 30 October 1987, Dean John Hogan of The College of Commerce and Business Administration presented Bob with a plaque in appreciation of his outstanding service to ORER.

Strategic Planning Process

The major highlight of 1987 was the Strategic Planning Conference held at the Allerton Conference Center on 20 and 21 August 1987. The conference was attended by the ORER Faculty, the Advisory Committee, and several invited guests, including Richard Arnould, Professor of Economics at UIUC; Terry Hendrickson, Vice President, Ticor Title Insurance; Ralph Martin, President, William L. Kunkel & Co.; Chester Moskel, President of the Home Builders Association of Greater Chicago; Jack Seymour, Savings and Loan Commissioner for the State of Illinois; George Shapland, owner, Flo-Con Corporation; Arlen Speckman, President, Speckman & Co.; and Howard Thomas, James Towey Distinguished Professor of Business Administration at UIUC. Professor Thomas served as the Strategic Planning Coordinator for the conference.

The purpose of the meeting was to assess the accomplishments of ORER during its first eight years of operation and to lay the foundation for its future development. One product of the process is a strategic planning document, which will soon be available. What follows is a summary of the most important questions raised during the process and the consensus of the people involved.

Real Estate as a Profession Is Changing. Is ORER in the Proper Niche?

The real estate profession is becoming more and more sophisticated; furthermore, it is a very heterogeneous profession encompassing the fields of finance, economics, planning, marketing, architecture, psychology, and many more. ORER has focused upon the economic and financial aspects of real estate and its approach has been rather academic and theoretical. Is this the proper approach? Should a broader approach be taken or should it continue to build upon the strength of the UIUC faculty?

The consensus of the conference is that ORER should continue to do what it does best, which is to produce high quality research that focuses upon the economic and financial aspects of real estate markets. However, a much greater effort must be made to market ORER's products. The effort should include improved

advertising and packaging of the various publications. Also essential is an increase in the percentage of papers that have direct relevance to real estate professionals.

Real Estate as a Field of University Study Is Changing. Should the UIUC Real Estate Program Change?

Many colleges and universities have responded to the increased demand for real estate courses by introducing real estate curricula. Some are in business schools, like UIUC, but many others are in urban planning departments and architecture schools. Indeed, several schools have introduced programs that encompass more than one college; for example, MIT has an M.S. Program in Real Estate Development in which students take courses in economics, finance, management, marketing, planning, architecture, and engineering. Should UIUC take this route or should it continue to focus on the economic and financial aspects of real estate?

UIUC is one of the few universities in the country that can provide a comprehensive real estate education because of its strength in the major disciplines relevant to real estate. Currently, however, students are merely encouraged to choose courses from the different colleges and departments. A long-range plan should include the possibility of introducing a formal interdisciplinary program in real estate. However, there are other, more pressing, short-run needs given the growth in the demand for training in the economic and financial aspects of real estate. Furthermore, many of the conference participants feel that teaching something as amorphous as "real estate development" is likely to be very difficult. Thus, the consensus was reached to maintain and improve upon the existing program while we continue to give thought to an interdisciplinary program. Also, a concentration in real estate for the MBA Program is being considered.

The ORER Budget Is Such that Our Base of Support Must Be Expanded if It Is to Continue to Grow. How Should This Be Done?

Historically, $25,000 to $50,000 has been available to support outside research awards. Unfortunately, the 1987–1988 budget has little discretionary money available to support new ORER Research Awards. The main reason is that revenues have remained relatively constant while expenses have continued to grow. Unless new sources of support are found, the research agenda will have to be cut and become increasingly dependent upon the interests and expertise of the immediate ORER staff.

All conferees agreed that the base of support for ORER should be enlarged. Specifically, it was suggested that the ORER Advisory Committee be expanded to include a wider range of real estate professionals. In addition, the support of other associations and large corporations will be solicited. It is hoped that added representation on the ORER Advisory Committee will bring increased awareness of ORER activities and thereby lead to additional financial support. Efforts are already underway to implement this stage of the plan.

Final Thoughts

1987 was an exciting year for ORER. We have seen once again how the academic and business communities can work together to produce valuable research and outstanding students. In 1988 we hope to build upon the momentum and ideas generated by the recent Strategic Planning process. Decisions will be made regarding new research directions, the size and composition of the Advisory Committee, and efforts to obtain additional financial support. As always, we are interested in the advice and opinions of the professionals within the Illinois real estate community, especially our alumni.

The Office of Real Estate Research (ORER) encourages all interested persons to contact the ORER office:

Office of Real Estate Research
304 David Kinley Hall
1407 West Gregory Drive
Urbana, Illinois 61801

with any questions or comments about this article or any article in this issue or to obtain copies of working papers, *ORER Letters*, the Rho Epsilon bulletin of upcoming graduates, or information on research awards through ORER or the Alumni Luncheons and alumni mailing list. ORER welcomes any questions, comments, or suggestions regarding the Office and its programs.

THOMAS S. ULEN

The Economic Theory of Eminent Domain

One of the guiding tenets of the law of real property is that an individual property owner is entitled to do whatever he chooses with his property so long as he does not unduly interfere with a like liberty of other property owners. Among other things, this allows the private owner to sell or give his property to whomever he chooses and, just as important, *not* to sell. There are, however, restrictions on this entitlement: for example, the government, using its power to "take" private property (also called its eminent domain or condemnation power), may legitimately compel individual owners to sell all or a part of their property to the government.

In this article I summarize an economic theory of the governmental eminent domain or "taking" power and use that theory to evaluate several recent court cases on the public use of private property. The point I wish to make is that the application of the theory would lead to the more efficient use of real property by both private owners and the government and that, to the extent that the courts have not been applying the theory, real property is being less efficiently used.

An Economic Theory of Governmental Taking

Let me develop the economic theory of takings by dealing with four related questions. First, what inefficiencies might this power impose and are there any potential offsetting efficiencies? Second, what restrictions might be imposed on the government's taking power in order to confine its use to circumstances in which the benefits exceed the costs? Specifically, consider the restrictions imposed on the federal government by the Fifth Amendment of the Constitution and on state governments by the Fourteenth Amendment: the government may take private property only if the taking is for a public use and the private owner is *justly compensated* (that is, he is given the objective or fair market value of his property). Third, what is the relationship between the taking power and the governmental power to regulate the use of private property? And finally, what incentives does compensation for taking create for private investment in and governmental use of real property?

Question 1: What Are The Potential Inefficiencies of Taking?

One of the largest potential inefficiencies of allowing the government to compel a sale of private property is that the forced sale may move the property from a higher-valued to a lower-valued use. This almost never happens in a voluntary sale of property: people exchange property only when it is worth more to the buyer than to the seller at the agreed-upon price. Suppose that Samson owns real property that his ancestors have occupied for longer than anyone can remember. He has, naturally, a great sentimental attachment to the land and, therefore, places a very high valuation on it, say, $1,000,000. But suppose further that the *objective* or *fair market* value of the property is much less, say, $500,000, based, perhaps, on the land's prospects as a commercial or residential development. Finally, suppose that the government desires to put Samson's property to a public use and can compel Samson to sell his property to it at fair market value. Presumably, the government has determined that the public use of the property is worth more than its fair market value, so from its point of view the transaction with Samson is value-enhancing. But from Samson's point of view, the compulsory sale is a disaster: he loses $500,000 of value. The compulsory sale has moved the property to a lower-valued use.

The inefficiency of the example is, of course, due to the interpretation of "just compensation" as being fair market value and to the discrepancy between objective or fair market value and subjective or idiosyncratic value. This possibility for an inefficient taking could be minimized by interpreting "just compensation" to mean the minimum price the owner is willing to accept for his property. In essence, this would make governmental purchases of private property indistinguishable from any other voluntary transaction. But there is an additional difficulty. If the government must pay a private owner's minimally acceptable selling price, then once the government has announced an intent to take, the private owner has a strong incentive to exaggerate the amount she will accept.

Question 2: Are There Potential Efficiencies from Governmental Taking?

These considerations lead to the question of whether there might be some potential social efficiencies or benefits from allowing the government to take private property for public use at fair market value. These efficiencies are most likely to arise if the government is engaged in purchasing private property in order to supply what economists call a "public good." Those are goods, such as fireworks displays and national defense, that private firms are not likely to provide because of the difficulties in getting those who consume public goods to reveal their willingness to pay for them. Typically, the government provides these goods or subsidizes private suppliers and forces consumers to pay for them through compulsory taxation. There are some public goods that are so large and complex, for example, interstate highways and a superconducting supercollider that is 53 miles in circumference, that they simply must be provided by the government. For these large and complex public goods, the social efficiencies from providing them might be so great that society should incur the potential inefficiencies of allowing the government to take private property at fair market value in order to provide them.

Question 3: Do the Public Use and Just Compensation Constraints on Taking Lead to Efficiency?

This brings us to the question of whether the imposition of the public use and just compensation restrictions confines the government's taking power to those circumstances in which the efficiencies or benefits of the taking exceed the inefficiencies or costs. The answer is that they *do* if those restrictions are interpreted as follows: "just compensation" must be interpreted to mean objective or fair market value, and "public use" or "public purpose" must be interpreted to mean governmental provision of a large, complex public good.

Question 4: What Incentives Does Compensation for Taking Create for Private Owners and Governmental Officials?

Frequently the government undertakes to affect the use of real property not by taking possession but rather by regulating its use. Why? Because the government is not obligated to compensate loss in value that occurs through legitimate regulation of public health, welfare, and morals. Whatever their social benefits, these regulations typically lead to a reduction in the value of the regulated property, prompting the private owners to contend that the regulation has gone so far as to amount to a taking of their property. The private owners sue the government (in what is called an "inverse condemnation" action) to have the regulation declared a taking so that the government will have to pay them the fair market value of their property. For its part, the government contends, first, that the regulation is an attempt to pursue a legitimate government regulatory aim and, second, that the reduction in value is not substantial enough to constitute a taking.

Whether regulations are usually or rarely interpreted as takings has important effects on the actions of both private owners and government officials. If the courts routinely treat regulations that lower property values, by however little, as takings requiring compensation of the private owner, then the government becomes, in essence, an insurer against loss in private property values arising from government action. This may induce private owners to make excessive investment in real property and its improvements and government officials to become wary of issuing regulations, thereby lessening the public good they might do. On the other hand, if the courts routinely interpret loss in private property values, however large, due to governmental action as noncompensable regulation, then private owners may become reluctant to invest in real property and improvements, and governmental officials may become overzealous regulators of private property rights.

The solution to this paradox of compensation for governmental taking and regulation is a taxation or option-purchase scheme between the government and private owners that is too complex to cover here and that has little chance of being implemented. (For a fuller discussion of these option and taxation plans, see Robert D. Cooter and Thomas S. Ulen, *Law and*

Economics Glenview, IL: Scott, Foresman, 1988.) Instead, as we shall see, the courts seek a balance between the inefficient extremes noted above, sometimes veering more toward one extreme, sometimes towards the other.

Theory in Practice: Recent Developments in Takings

The tension between the rights of the private property owner and the public use of his property regularly appears in actions before state supreme courts and the United States Supreme Court. One important recent trend has been a weakening of the public-use constraint on the governmental taking power. While the courts never enunciated the efficient definition of public use suggested above, there was nonetheless a widespread consensus that taking should be confined to such clearly public goods as irrigation, drainage, reclamation of wetlands, highways, and the like. But the broad trend recently in the taking field has been judicial deference toward legislative judgment as to public use. Consider, for example, *Poletown Neighborhood Council v. City of Detroit*, a case that came to the Michigan Supreme Court in 1981. In 1980 the General Motors Corporation informed the City of Detroit that it intended to close its Cadillac plant and to move to the Sunbelt unless the City provided extensive improvements to the freeways, streets, and sewers around the plant. Fearing the loss of 6,000 jobs and much corporate income tax revenue, the city took private property around the site and turned it over to GM at a price far below its market value. The property taken was in a closely knit ethnic community for many of whose residents there was a subjective valuation on residence far above the fair market value of their homes. A majority of the court held that the retention of the jobs and of the corporate income tax revenues was a valid public use. The court should have considered whether it might not have been better to void the taking in order to induce the city to find some other method of helping GM that would have spread the costs over a broader base.

In *Hawaii v. Midkiff* (1984) the United States Supreme Court also undertook to broaden the notion of public use. The issue turned on an action by the Hawaii state legislature to distribute land ownership rights more broadly. Because of Hawaii's early monarchy and feudal land tenure, land ownership rights in the state were concentrated in a few hands: the state and federal government owned 49 percent of the land in Hawaii, and another 47 percent was in the hands of 72 private landowners. In the Hawaii Land Reform Act of 1967, the legislature allowed current lessees of land to employ the Hawaii Housing Authority to take the land they rented in exchange for paying fair market value to the owners. Midkiff protested that this amounted to compelling the sale of private property not for public use but for *private* use. The Court held that the Hawaii state legislature's purpose of more broadly distributing land ownership was a valid public purpose for compelling the sale of private property.

The cumulative impact of these decisions is that it is now difficult to imagine a government-mandated

purchase of private property, including those for resale to another private individual, that does not satisfy the public use restriction. This is bound to have adverse consequences on the efficient use of private property and on the incentives created for the regulation and use of private property by governmental officials.

I want to be careful to note that I am *not* saying that the ends sought in the *Poletown* and *Midkiff* cases are not legitimate governmental ends. Indeed, they are. I am, instead, making the claim that the compulsory sale of private property may not have been the best or most efficient way to accomplish those ends.

At the end of its last term, the United States Supreme Court handed down three important decisions having to do with whether certain governmental regulations amounted to the taking of private property. The cases are important because they signal a turn away from the broadening trend of the public use cases and a move toward the more efficient balance between public and private use of property suggested by the economic theory.

The issue in *Keystone Bituminous Coal Association v. DeBenedictis* was whether a Pennsylvania act prohibiting coal mining that might cause subsidence damage to preexisting buildings, dwellings, and cemeteries effected a taking of private property of coal mine owners. The owners contended that by requiring them to leave 50 percent of the coal beneath threatened structures, the regulation so lowered the value of their subsurface rights as to amount to a taking. The Court held that the Act was a legitimate regulation of public safety and that the loss of property value was not large enough to convert the regulation into a taking, principally because the Act affected only 2 percent of the total holdings of the coal mine owners' association.

A different issue was at the heart of *First Evangelical Lutheran Church of Glendale v. County of Los Angeles.* The church had purchased land outside the City of Los Angeles in 1957 to operate as a camp for handicapped children and as a church retreat. In 1978 a flood destroyed the camp's buildings, and in response the County of Los Angeles adopted an ordinance prohibiting the construction or repair of any building in a flood protection area, which included the church's property. The Church contended that this regulation denied it any use of its property and, therefore, amounted to a compensable taking. In the meantime the County rescinded the ordinance so that the issue became whether the church was entitled to compensation for temporary loss of its property caused by a regulation. The Supreme Court held for the first time that the ordinance, though temporary, had been a compensable taking.

Finally, *Nollan v. California Coastal Commission* delivered one of the most important recent statements on the relationship between private and public use of property. The Nollans owned property along the coast, including the beachfront. On either side of their land was a public beach. Because the Nollans owned the beachfront, no one could pass between the public beaches without trespassing on their private property. The Nollans applied to the California Coastal

Commission for permission to build a much larger house on their property. The Commission granted the permit on the condition that the Nollans allow the public an easement across their beachfront. The Nollans brought an action contending that the easement in exchange for the building permit was a regulation that amounted to a compensable taking. The Supreme Court held that if the condition, the easement, had furthered the same legitimate regulatory purpose advanced by the building permit, then it, too, would have been legitimate. Thus, for example, if the Nollans' new home would have blocked the public's view of the beach from the public highway, then the Commission might legitimately have extracted from the Nollans an easement from the highway to the beach in order to allow the public to view the Nollans' beach. But the easement was not for that purpose; rather it was to allow easier access across the Nollans' property for users of the public beaches, something completely independent of the building permit. In the Court's view this was not closely enough related to the detriment caused by the new home. The Commission still remained free to advance its program of public use of the California coast by exercising its eminent domain power and paying for access easements.

Conclusion

The economic analysis of governmental taking offers a justification and an interpretation of the public use and just compensation restrictions on the public use of private property that preserves an efficient balance between the private and public use of property. Until recently, state and federal courts had defined public use and just compensation in ways that could be defended using the efficiency analysis. But lately courts have allowed virtually anything to count as a legitimate public use and have begun to broaden the notion of noncompensable regulation. These trends inevitably lead to the less efficient use of real property.

However, in the three key cases I discussed above—*Keystone Bituminous Coal Association v. DeBenedictis, First Evangelical Lutheran Church of Glendale v. County of Los Angeles,* and *Nollan v. California Coastal Commission*—the United States Supreme Court has begun to redraw the line between noncompensable regulation and compensable taking much more favorably to the private owner and much less favorably to the government. The result should be a more efficient balance between the private and public use of property.

Thomas S. Ulen is an associate professor of economics at the University of Illinois at Urbana-Champaign.

MARY COVENY

Improving the Odds: Effective Salesperson Selection via Profiling

Is the high attrition rate among real estate salespeople a fact of life or are there ways to refine the selection process? Can we lock or at least slow the "revolving door"? Losses of 30 to 50 percent of new salespeople during their first two years are the norm.

This article reports my study on the use of personality profiles to develop information that would help the broker choosing salespeople. I found that top producers among a group of suburban Chicagoland residential salespeople are easily identified, through personality profiling, by the extent to which they are self-starters, self-motivated, and self-sufficient. One profile performed three times more effectively than the estimated current industry practices. At the same time, background factors fail to give any clues to which salesperson would be a high-volume producer or to what group a broker might target career marketing efforts.

The Costs of Turnover

It is relatively easy to underestimate the expense to brokers of sales personnel attrition in recruiting expenses (ads, printing, postage), career seminars, prelicensing rebates, training, and staff time. More difficult to measure is business opportunity lost when a new or unproductive Realtor-Associate fails to convert incoming responses to signs or ads into sales. The salesperson who might have chosen another career has lost the salary from that job and has experienced ego damage and feelings of failure. Morale within the sales office drops as well.

Respect for brokerage services, the perceived status and desirability of a real estate career, and the image of professionalism are indirect casualties of high turnover. These factors are likely contributors to real estate companies' inability to attract strong candidates. Klimosky and Childs (1981) found that, of individuals enrolling in an Ohio real estate prelicensing class, those with a high sales drive most often chose other careers. They suggest that the real estate industry competes with blue collar and clerical positions for available job seekers. It may be that the best candidates are selecting themselves out because of the problems mentioned previously.

Factors in the Use of Profiling

In deciding whether or not to make a profile part of the sales selection process, one needs to know whether it offers an effectiveness rate higher than current procedures. A profile should not be judged against a standard of error-free prediction, according to Klimoski (1978), "but against the error-rate currently found in the organization. To say that a test is not useful because it is wrong 35 percent of the time is not a fair criticism if current selection procedures are wrong 50 percent of the time."

Klimosky and Sackett (1978) suggest determining a "base rate" for a firm—that "percent of the work force which at present is viewed by management as successful." This rate is determined by the attrition rate for new salespeople and on the number of salespeople remaining who earn a living wage. For example, in 1984, 41.8 percent of this country's licensed salespeople who responded to a National Association of Realtors®, survey earned a $20,000 annual income, which might be considered the minimum necessary to retain a career-minded individual. One third or more of all new salespeople leave in the first 12 months. Of the remaining 67 percent, 41.8 percent earn $20,000 or more per year. The base rate is 28 percent (.67 x .418 = .28). This is a conservative (optimistic) estimate of an National Association of Realtors® base rate because a third of the total membership turns over each year, and attrition is likely to be higher for first year people.

How does the broker evaluate the effectiveness of a given profile? Comparisons are difficult because not all profiles are validated on a sample of sufficient size, or that sample was not exclusively from real estate sales. There is a reluctance on the part of those marketing profiles to provide what they consider proprietary confirmation. When information is available, it is often couched in highly technical terms; and the broker may be at a loss to know how to evaluate it. In addition, some have had experiences with bad profiles, clumsy interpretations, or have personally been the victims of predication errors. The user manual for a profile commonly used in the insurance industry only claims to be 35 percent effective. A coin toss may be preferable to a bad profile.

Data and Methodology

The purpose here is to study the ability of profiling, either through personality profiling or by sketching an image of the successful associate's background, to predict performance. In addition, the study would offer data on the effectiveness of personality profiling from a source independent of the test publishers.

The approach was one of concurrent, not predictive, validation to eliminate the wait for a new salesperson to become established. For that reason, these results should not be read as a recommendation for or against either as a selection tool. This sample included only those with at least 12 months' experience. Profiles are designed to be used on a predictive basis, at the initial interview. The effectiveness of each of the profiles used with this group may differ when that same profile is used, as intended, at the selection interview.

Only those profiles costing less than $100 were considered because the likelihood of widespread use of more expensive ones by brokers was doubtful. The first personality measure, the Personal Orientation Profile (P.O.P.) has been validated by its developer on Canadian real estate salespersons.[1] Specific validity and

reliability information was not available from the publisher, who did report that the P.O.P. was able to predict production levels with 80 to 88 percent accuracy when used at the initial interview. The P.O.P. was also recommended by the brokers who use it for is ability to identify specific training and development as well as supervisory needs. Also, potential problem areas are identified and questions are suggested for use in a second interview. Finally, the P.O.P. outlines the retention considerations specific and unique to each individual.

The second profile, the Personal Evaluation Program (P.E.P.),[2] reduced turnover of management trainees 56 percent in another industry. Both instruments showed considerable promise and have received good references from brokers who have used them.

In addition, a questionnaire was developed based on previous Ohio research. It was intended to determine whether or not those factors that predicted the establishment of real estate career were also related to production levels. No attempt was made to include those factors, like age and gender, that had not been shown to be highly significant by previous research and would not be helpful in making certain types of selection decisions. For example, Follain, Lutes, and Meier (1986) said that 52 percent of Illinois Realtor-Associates are female and their average age is 47. This kind of information is important in that it tells us that men and women can earn equally and that individuals of ages 22 or 82 are statistically under-represented compared to those in their thirties, forties, and fifties; it does not guide the broker who is interviewing two men, one aged 39 and the other aged 56. Should both, either, or neither be selected?

Because training, management philosophy, commission split, bonus incentive programs, and working atmosphere all influence productivity, the impact of these factors should be relatively consistent within a single firm. The subjects in the study were all residential real estate salespersons affiliated with First United Realtors as independent contractors during the calendar year 1984. They came from a variety of socioeconomic areas in the western and northwest suburban Chicago area with average 1984 sales prices in the communities ranging from $54,100 to $149,600. Attrition due to a lack of training was expected to be minimal because the firm provided 50–60 hours training by branch managers and 100 hours of classroom training. After the study began, Follain, Lutes, and Meier (1986) identified firm size and firm type as determinants of sales volume: an individual's income increased approximately one percent for each person in the firm's work force, and those salespersons who worked for a financial conglomerate or franchise tended to earn slightly less. An independent firm such as First United Realtors, which then had 400 salespersons, should maximize opportunities for earnings and the potential handicap imposed by the negative aspects of firm size and type should be minimal in this group of subjects.

All salespersons were ranked by production and the entire group divided into four equal parts. Thirty salespersons were randomly drawn from the top-producing 25 percent or quartile, 30 from the lowest-producing quartile, and 15 each from the second and third quartiles. Personal data was kept strictly confidential, and participation was voluntary. Using volunteers always introduces a certain amount of bias because there is no way to determine if the people who agreed to participate were in some way different from those who declined.

The typical salesperson worked 43.5 hours a week, had seven years experience, owned only one property when their real estate sales career began, and had a net worth of over $186,000.

The conventional wisdom is that 20 percent of the Realtor-Associates sell 80 percent of all property. The findings here are that about one third, instead of 20 percent, were the truly productive; the distribution of units sold in 1984 is quite positively skewed with about two-thirds of the subjects selling 20 or fewer units and one-third selling from 20 to 50 plus. A unit was defined as either a listing or a sale. It became apparent that a far clearer picture emerges using the top and bottom thirds instead of the originally planned 25 percent or quartile groups.

The entire distribution of scores was examined via a regression analysis to determine which of the many factors were related to performance. Because two-thirds of the scores fell between one and twenty units, a discriminant analysis was also used to compare only the upper and lower thirds. The discriminate analysis is less sensitive to distortion from the skewed or uneven distribution of sales.

Results of the Analysis

We expected to find a connection between production and initiation as demonstrated by community involvement, part-time work, or extracurricular activities in school, and perhaps a history of self-supporting at an early age. It also seemed likely that the factors, like net worth and realistic expectations, which were related to establishing a career, also predisposed a salesperson to a higher production levels.

In fact, much of what we expected to find was not evident in this sample. Items that failed to predict sales success included experience, prior type and hours of work, number of moves and transfers, present community organization involvement, part-time work and/or extracurricular activities in high school and college, other family members in real estate sales, age first self-supporting, work missed due to illness, and household income. There was no apparent correlation with financial expectations or realistic information at the time the sales career began, importance of the first sales manager, or financial versus family, social, and personal priorities. The importance of career choice factors such as low entry costs, increased income, autonomy, and minimal preparation were evenly distributed across the production groups and also failed to predict income or sales.

The report from top producers that they experience less fatigue than others is consistent with the long work

week reported by those same top producers. They also saw a "flexible schedule" as less important in choosing a real estate career than others saw it. The pressures of working long hours may have caused them to abandon the notion of a flexible schedule or it may genuinely have been of less importance from the beginning.

We sought factors evident at the beginning of sales career that might show a connection with a longer work week in real estate, but found more. Hours worked in a previous job were unrelated to hours worked in real estate. Perhaps someone whose personality and temperament are well suited to sales may be quite willing to put in the hours necessary for top production.

The Personal Orientation Profile proved remarkably effective in predicting each salesperson's performance level at the time of the study. Both the P.O.P.'s predictor score and the predicted performance level show an extremely strong correlation with productivity.

A correlation or relationship was also shown between productivity and five individual P.O.P. scales. The strongest of these is a highly significant correlation between productivity and enterprising potential, defined as "the degree to which an individual is a self-starter, self-sufficient, and self-motivated as these qualities pertain to accomplishing job goals. This scale identifies the type of training and development required by new hires."

A significant negative correlation is shown between commissions earned and people orientation; top producers were less likely than others to find "personal satisfaction in polite chit-chat." The first of two potential explanations is that, by the end of a long day filled with many hours of conversation and problem-solving, top producers are simply "peopled out." A second possibility is that top producers are more intensively task-oriented than others. They may enjoy conversation on a topic of personal interest or one that will result in a new prospect, but care little for small talk.

A slight negative correlation is shown between top production levels and the P.O.P.'s investigation scale, defined as "the degree of personal satisfaction derived from facts, figures, details and analytic activities." Top salespeople may be very competent in these areas, but may tend to lack interest in detail-intensive activities. This confirms the conventional wisdom, but the correlation here is only a slight one.

With this particular group of existing salespersons, the total score of the second profile, the Personal Evaluation Program, did not perform at a statistically significant level—although three scales showed slight correlations.

Error Frequencies		Predicted Group		
		Low	High	
Actual Group	Low	17	5	22
	High	7	22	29
		24	27	51

Average accuracy of classification = 76 percent

From the data a formula was devised that allowed the rank ordering of this group of salespeople according to their sales volume. The formula was 76 percent accurate and could be used to predict the number of sales with the same degree of accuracy. Profiling appears to be a route worth further exploration.

Personality profiling is intended to supplement, not replace, the manager's experience and judgment; no profile should be more than 30–35 percent of the selection decision. It is not intended to substitute for in-depth interviewing and careful reference-checking. It offers no assessment of communication skills nor indication of presentable grooming. In one way, this makes a 76 percent accuracy level all the more remarkable.

The question "do you get more or less tired than others performing the same activity?" cannot be asked directly without the applicant guessing the desired answer. A possible alternative might to "tell me about a typical day." The response must then be ranked by the interviewer.

Conclusions

The most important findings are that (1) high producers are clearly identifiable via personality profiling; (2) top producers are self-starters, self-sufficient, and self-motivated and are less easily fatigued than others; and (3) interview questions about background items may not predict production. Because a formula based on one particular profile was about three times more effective than industry procedures now in use, we may wish to continue to gather and share data on turnover costs and selection effectiveness. The result of such a national dialogue may be enormous short-term savings plus increased per-person production for years to come.

Mary Coveny is President of CareerMatch Consultants, Inc., in Naperville, Illinois. A longer version of this paper is available from the Office of Real Estate Research, 304 David Kinley Hall, 1407 West Gregory Drive, Urbana, IL 61801.

DAVID L. CHICOINE AND J. FRED GIERTZ

Real Estate Tax Assessment Uniformity in Illinois

Real property tax receipts of local government in Illinois are the largest single revenue source for both the state and for local governments. Property tax extensions amount to over $6 billion annually. This is about twice the amount generated by the state's individual income tax, only slightly less than twice the state's sales tax receipts. The property tax is the most important independent revenue source for about 6,000 Illinois local governments and is the single most important revenue funding primary and secondary education.

Fundamental to the operation of the real estate tax is the valuation or assessment of property for tax purposes. The accuracy of property assessments is critical to the fairness of property taxation. At issue is how property taxes are apportioned among properties, according to the standards of equity contained in property tax law. Often-heard criticism of the real property tax is that inaccurate and nonuniform assessments are intrinsic to the tax and not easily corrected either through administrative actions or policy reforms.

We recently completed a major study of the structure and performance of the Illinois property tax assessment system, and we present highlights of this study here. A survey of all local and county assessing officials and records from the files of the Illinois Department of Revenue were the source of data for the study. The purpose of the study was to describe the property assessment system in Illinois and to analyze factors influencing assessment uniformity. Because of the unique features of property assessment in Cook and St. Clair counties and the differential method of assessing farm property, the study focuses on assessment of nonfarm property in the other 100 Illinois counties.

Tax Fairness and Assessment Uniformity

The property tax has always been controversial, but it has real staying power, and there seems little likelihood that it will be removed from the Illinois public finance system in the foreseeable future. Therefore, fairness in the administration of the property tax is critical. Assessment equity or fairness deals with the uniformity of assessments, particularly within taxing jurisdictions. Uniform assessments in a jurisdiction mean all properties are valued for tax purposes at the same percentage of market value. Nonuniformity of assessments within a jurisdiction means that property tax burdens will not be distributed in the manner legally defined as fair.

Departure from the standard of uniformity in assessments represents a violation of the principle of assessment equity. This violation means some taxpayers pay more tax than they should while others pay less than they should. For example, 31 counties in Illinois in 1983 had an average property tax bill either 50 percent more or 50 percent less than the correct amount because of assessment deficiencies.

Assessment uniformity is measured with the use of assessment/sales ratio studies. In Illinois these studies are conducted annually by the Illinois Department of Revenue for all counties and all local assessing districts with sufficient real estate market activity. The coefficient of inter-area dispersion (CD) is the most widely used measure of assessment uniformity and is calculated as part of assessment/sales ratio studies. The CD can be thought of as the average percentage (for example, 15, 20, or 25 percent) by which assessment levels on individual parcels in a jurisdiction vary from the median assessment level. The CD increases in value with a lower quality of assessment (that is, less assessment uniformity among parcels). A CD of zero would indicate every parcel included in the assessment/sales ratio study was assessed at precisely the same percentage of its selling price as every other parcel. A CD of 50, on the other hand, means that parcels included in the study had an assessment level that deviated from the median level (either above or below) by 50 percent. The average property owner in such a jurisdiction is paying either one-half or one and one-half times the amount of tax that should be paid if assessments were uniform.

There is no absolute level of uniformity that constitutes good or poor assessment quality. However, a standard between 15 and 20 is often considered a mark of good assessing and acceptable assessment uniformity. The variation in CDs among Illinois counties is substantial. Presented in the first column of the table are the CDs for 1983. Data for 1984, the most recent available, are similar to the 1983 information. The range in 1983 is from 15.6 in DuPage to 129.1 in Pulaski County. In 1983, six counties were under 21, 11 between 21 and 30, 34 counties between 31 and 40, and 50 counties over 40.

Since the difficulty of achieving uniform assessments varies from place to place, direct comparison of CDs as an indication of relative performance of assessing officials must be done with care. However, there is clear evidence that some areas in Illinois are assessed very poorly.

The estimated effects of nonuniform assessments on real estate tax payments of homeowners are presented in the second column in the table. The average over or underpayments were calculated using the average tax bill on single-family homes and the CD. For example, in Adams County nonuniform assessments resulted in an estimated over or underpayment of $188 in property taxes in 1983. The range is from $156 in Jasper County to $548 in St. Clair County. The average over or underpayment is inversely related to the CD, but directly related to the average tax bill. Thus, payment

discrepancies in the more populous counties were high, even though CDs were low, because of larger average tax bills on single-family homes.

It should be noted that assessment uniformity has little to do with whether average property tax payments are high or low. Assessment equity deals with the distribution of total tax collections among property owners. The real benefit of assessment uniformity is that it provides for an equitable distribution of the tax burden according to the legally defined tax base. Thus, improving assessment equity implies savings by those overassessed and offsetting tax increases for those underassessed. Costs of improving uniformity will include higher public spending on assessing operations and political resistance by taxpayers with underassessed property.

The Illinois Assessment System

The assessment of real property in Illinois is primarily a local government function with state involvement. In 85 Illinois counties, elected local (township or multi-township) assessors have primary responsibility for initial assessments. Each county has a Supervisor of Assessments who oversees and, if necessary, revises the assessments set by local assessors. In Cook and the 17 commission counties, the elected Cook County Assessor and the Supervisor of Assessments are the responsible officials, respectively. The Illinois Department of Revenue carries out the equalization process among counties, and property owners who believe their property has been assessed improperly have access to an appeals process.

Local assessing districts in township counties are dominated by very small jurisdictions (49 percent of the 917 downstate districts have populations of 2,000 or less). It is common in smaller districts for all property other than single-family homes to be centrally assessed by county supervisors. A frequently advocated reform is the organization of assessing operations into larger units. The objective is to reduce costs and improve the quality of assessing and assessment uniformity.

Determinants of Assessment Uniformity

A statistical analysis was conducted to determine factors (both those under the control of assessors and those external to the assessment process) that are associated with assessment uniformity in Illinois counties and local assessing districts. One of the uses of the results is to evaluate the performance of the assessment system in counties in relation to the difficulty of the assessment task. Information on what determines assessment uniformity is the first step toward formulating recommendations that might improve the quality of assessments in Illinois and, thus, the fairness of the distribution of property taxes.

Assessment uniformity, as measured by the CD, can be thought of as being determined by a combination of the quality of the assessor (as well as resources available to the assessor) and the environment in which assessments are made. Expectations are that more highly skilled assessors in larger, more centralized assessing organizations will perform better than less-skilled individuals in smaller, less well-endowed organizations. Likewise, the more difficult the assessment environment, the less uniform assessments are expected to be, all things considered. Because Illinois has centralized assessing in commission counties and decentralized assessing in township counties, the impact of assessing district size and organization on uniformity can be analyzed. Important to the analysis is distinguishing the influence of environmental factors from the influence of assessor characteristics and assessment organization.

Using data from the survey of assessing officials and the files of the Department of Revenue, variation in the coefficient of dispersion among counties and among local assessing districts was investigated with multiple regression analysis. Similar factors were found to improve assessment uniformity in local assessing districts and in counties. Environmental factors that improved assessment uniformity were the percentage change in the number of housing units, the average tax bill for a home owner, and educational level of the population. Assessors need information to set assessments accurately, and an active housing market with new construction increases available information and, thus, improves uniformity of assessments. The average tax bill indicates the advantage of assessment appeals, and a more educated citizenry is more able to take advantage of the rather complex appeals process.

Environmental factors associated with lower levels of uniformity included the percentage change in housing values and the nonuniformity of the housing stock. Housing markets with substantial changes in value and with different types and ages of homes complicate the assessment task and reduce assessment uniformity.

Chart 1 illustrates the impact of the change in the number of housing units on assessment uniformity for Illinois counties. There are two relationships presented because assessment uniformity was found to be significantly better in township counties compared to commission counties when other factors were considered. These results certainly do not support consolidating property assessment responsibilities with county government. On the other hand, the number of assessing districts in a county was inversely related to uniformity, indicating possible advantages of

Chart 1. Number of Assessing Jurisdictions (township counties)

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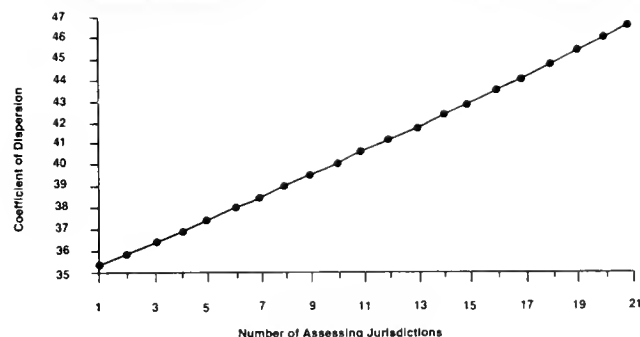
consolidating the smallest local districts (Chart 2). The analysis of uniformity among local districts supported this finding. Larger districts had more uniform assessments, but the advantage of size was not important beyond 4,000 population (70 percent of the local assessing districts are under 4,000).

Higher levels of professional training for county supervisors and local assessors were found to improve assessment uniformity. Well-trained assessors, at the local and county level, are very important in achieving property tax fairness.
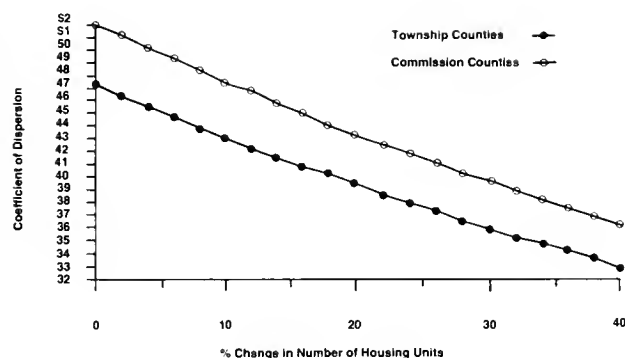
The results of the analysis of assessment uniformity were used to adjust actual county-level CDs for the difficulty of the assessment environment. Such adjustments allow for more meaningful comparisons of the performance of assessors across counties and help distinguish between good assessing and good assessments. The environmentally adjusted CD for each county is presented in the last column of the table. The adjusted CD for each county is the average or expected level of performance for that county, given its assessment environment. This column can be

Assessment Uniformity and Effects of Nonuniformity and Assessing Environment, 1983

County	Average Coefficient of Dispersion	Adjusted Over or Underpayment of Taxes	Coefficient of Dispersion	County	Average Coefficient of Dispersion	Adjusted Over or Underpayment of Taxes	Coefficient of Dispersion
Adams	27.5	$188	41.0	Lawrence	51.3	234	46.8
Alexander	103.4	448	70.4	Lee	38.9	291	37.8
Bond	35.1	209	41.6	Livingston	46.2	390	45.7
Boone	33.0	275	26.9	Logan	32.5	277	40.6
Brown	48.7	250	60.3	McDonough	33.5	251	32.4
Bureau	46.3	382	45.5	McHenry	18.0	254	22.2
Calhoun	56.8	252	64.0	McLean	20.8	176	27.1
Carroll	73.5	490	55.1	Macon	33.1	272	35.0
Cass	52.8	351	42.2	Macoupin	68.4	413	48.1
Champaign	22.3	237	25.8	Madison	35.8	262	43.3
Christian	40.3	257	49.6	Marion	46.9	308	45.6
Clark	45.8	227	41.5	Marshall	66.9	531	40.4
Clay	41.4	220	51.5	Mason	38.6	271	39.9
Clinton	35.5	232	41.7	Massac	48.5	265	53.8
Coles	28.3	208	34.9	Menard	50.9	413	43.1
Cook	25.1	225	32.7	Mercer	29.2	223	42.3
Crawford	43.0	210	45.2	Monroe	25.3	198	44.2
Cumberland	58.0	314	44.2	Montgomery	69.7	379	56.9
DeKalb	21.1	252	27.6	Morgan	38.0	263	39.3
DeWitt	36.2	226	42.5	Moultrie	35.8	255	39.3
Douglas	45.0	290	43.6	Ogle	48.0	388	37.4
DuPage	15.6	278	11.4	Peoria	37.5	445	33.2
Edgar	35.1	177	45.9	Perry	64.3	356	55.1
Edwards	50.7	214	64.7	Piatt	36.3	246	40.7
Effingham	30.8	199	37.8	Pike	39.4	166	53.1
Fayette	50.1	270	52.6	Pope	47.6	173	68.5
Ford	42.5	286	38.6	Pulaski	129.0	385	68.8
Franklin	63.2	395	49.0	Putnam	44.0	316	35.4
Fulton	57.9	441	48.7	Randolf	42.6	252	44.1
Gallatin	69.7	289	62.5	Richland	33.2	189	43.1
Greene	56.4	243	50.4	Rock Island	35.8	354	34.3
Grundy	35.4	265	38.3	St. Clair	76.0	548	50.3
Hamilton	52.8	291	55.7	Saline	32.0	177	52.7
Hancock	58.3	320	46.2	Sangamon	38.2	344	31.8
Hardin	52.0	180	57.9	Schuyler	67.4	384	47.9
Henderson	35.4	190	45.8	Scott	71.5	311	58.7
Henry	47.9	369	43.0	Shelby	53.0	320	47.5
Iroquois	74.4	534	45.1	Stark	50.5	372	48.3
Jackson	37.8	318	25.2	Stephenson	34.4	265	38.5
Jasper	35.4	156	44.9	Tazewell	40.7	417	29.8
Jefferson	45.0	304	39.6	Union	71.0	505	54.5
Jersey	47.7	296	38.3	Vermilion	35.9	256	42.5
JoDaviess	60.9	379	42.3	Wabash	38.3	226	48.9
Johnson	66.4	365	50.3	Warren	45.7	325	46.2
Kane	18.5	247	27.8	Washington	52.4	339	54.3
Kankakee	28.6	238	33.4	Wayne	51.2	301	43.7
Kendall	19.2	218	16.7	White	30.1	157	40.7
Knox	37.9	279	37.3	Whiteside	39.3	326	38.0
Lake	18.9	314	21.0	Will	24.1	325	24.8
LaSalle	41.1	328	50.0	Williamson	45.5	221	44.8
				Winnebago	27.7	287	29.1
				Woodford	33.4	328	31.5

Chart 2. Change in Housing Units (county data)

Chart 2. Change in Housing Units (county data)

compared with the "raw" CDs in the first column. An actual CD in a county that is less than the adjusted CD indicates the assessment system is performing at a higher level than would be expected, given the degree of difficulty of the assessment task. Similarly, an actual CD that exceeds the adjusted CD indicates the system is not performing as well as might be expected given the assessing environment.

Conclusions

Improving the fairness of the property tax in Illinois will require significantly improved assessment uniformity in many parts of the state. The results of this study demonstrated the impact of environmental, organizational, and assessor characteristics on assessment uniformity and suggest that serious consideration should be given to raising the minimum population of local districts to at least 4,000 or requiring small districts to contract for assessing services. Because environmental factors seem especially important in determining assessment uniformity, the use of a single uniformity standard to judge the performance of assessing officials and as a benchmark in incentive programs aimed at improving assessment uniformity is questionable. Universal standards are arbitrary, inflexible, and do not consider the various difficulties facing assessors in different locations. Measures of assessing quality should reflect the difficulty of the assessing environment if they are to measure the performance of county and local assessing officials accurately and distinguish poor assessing from good assessing.

David L. Chicoine is Professor of Agricultural Economics and J. Fred Giertz is Professor of Economics. Both are in the Institute of Government and Public Affairs at the University of Illinois. Research reported here was supported in part by the Office of Real Estate Research. Copies of the complete study, Property Tax Assessment in Illinois: Structure and Performance, *are available from the sponsor of the study, the Illinois Tax Foundation (201 East Adams St., Springfield, IL 62701) or the authors.*

PETER F. COLWELL

# Patterns in Construction Activity in Illinois 1972–1987

Construction activity has fluctuated greatly in Illinois over the past 18 years. These fluctuations are examined here by following the values of building permits in the state as a whole and in the five Metropolitan Statistical Areas of Chicago, Rockford, Decatur, Peoria, and Kankakee.

While there are stark differences among the five areas, there are also similarities. They have the same overall pattern for the time period: All areas show strong cyclical movements; all have peaks around 1977–1978 and 1985–1987; and almost all are expected to do better in 1987 than 1986 (based on the first seven months of data for 1987).

The State

Even though it appears that 1986 had the highest nominal residential construction activity, this is probably not the case. Chart 1 shows three peaks in single-family permits over the past 17 years. The first was a minor one in about 1972. The second was substantially greater for 1977 and 1978. The third occurred in 1986. However, 1987 includes only data for the first seven months. Hence, if we compare this number with the first seven months of 1986, we would find that there was an increase in permits for single-family homes. Permits for multifamily buildings show four peaks: the first in 1971–1972, the second in 1978–1979, a smaller one in 1983, and a larger one in 1986. Again, 1987 is larger when comparing the first

Chart 1. Building Permits, Illinois

Chart 1. Building Permits, Illinois

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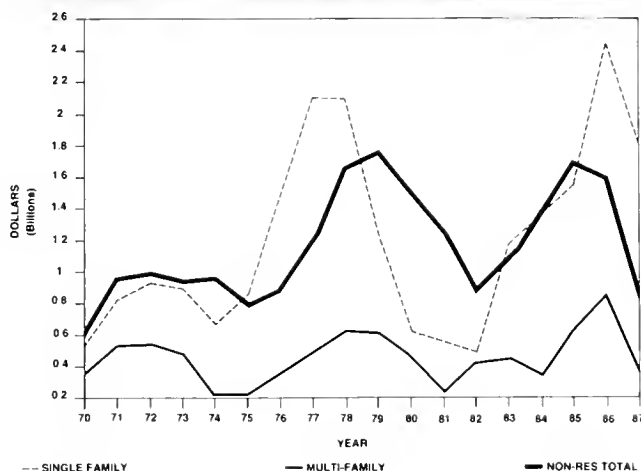
seven months of data for both years (1986 and 1987). The nonresidential activity shows three peaks like single family permits: the first in 1972, the second in 1979, and the third in 1985. Also as in the case of single-family permits, the first peak was relatively small. The timing of nonresidential peaks is a little different, however. It might be that the earlier lag represents local service following the suburbanization of residences while the more recent lead represents the expansion of regional export activity.

In the state as a whole, there are parallels in the cyclical movements of different building permit types. All three permit types seem to move somewhat together. Single-family permits is the largest of the components, with nonresidential permits a close second and multifamily a distant third. Nonresidential building permits seem to lag behind single-family permits until 1982 and to lead thereafter.

Rockford

Instead of having its biggest peak in 1986, Rockford's single-family permits experienced the largest peaks in the 1977–1978 period (see Chart 2). However, the recoveries in the building permits in 1987 are predictable and, most likely, the values of building permits are going to be larger than in the 1977–1978 period. In the face of the shutdown of Quaker Oats, the recent issuance of building permits in Rockford is spectacular and may bode well for the future.

Cyclical patterns are observed in the Rockford data. Multifamily and nonresidential permits seem to lag one year behind single-family permits. This is as expected because when population grows or relocates (which is reflected in residential building permits), local service activities grow or relocate as well: Residential growth brings about the need for nonresidential buildings such as shops, schools, churches, and so on.

Chicago

Chicago building permit patterns are similar to those of the state as a whole. This is not surprising since it is the biggest urban area in Illinois and, therefore, contributes more than the other areas to the state totals.

Chicago experienced a lag in the nonresidential market vis à vis the single-family market from 1970 to 1984 (see Chart 3). However, the lag has become a lead for the most recent three years. This reversal is experienced elsewhere in the state as well.

The value of Chicago permits in 1987 for single- and multifamily permits will probably exceed that in 1986. This will not be the case for nonresidential permits. Nevertheless, the pace of nonresidential building in 1987 should still prove to be very rapid.

Decatur

Chart 4 shows two significant spikes in Decatur permits, one in 1973 and one in 1980. Both were in nonresidential permits. Otherwise, there has been relatively little activity for a number of years. The 1980 spike reflects construction of Hickory Point Mall, hotels, and office buildings. The slight recovery in nonresidential permits in 1986 relates to a number of
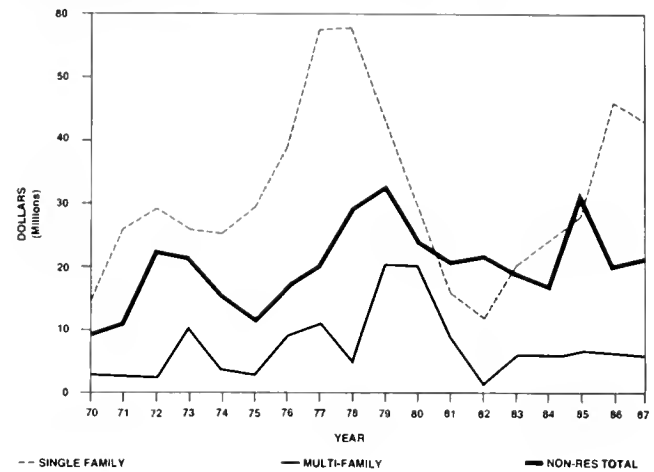
Chart 2. Rockford Building Permits
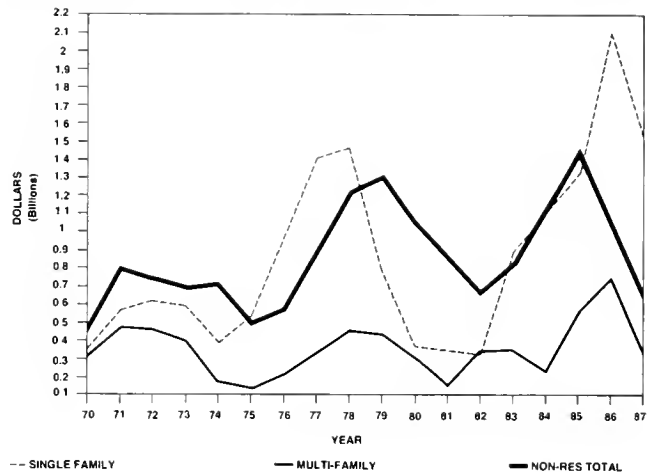

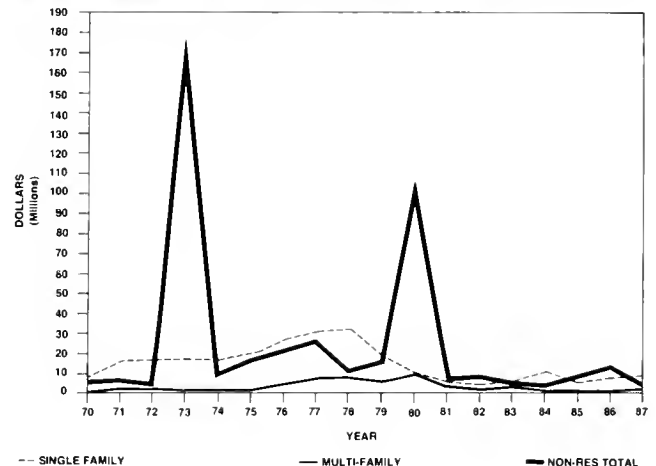**Chart 3. Chicago Building Permits**

Chart 4. Decatur Building Permits
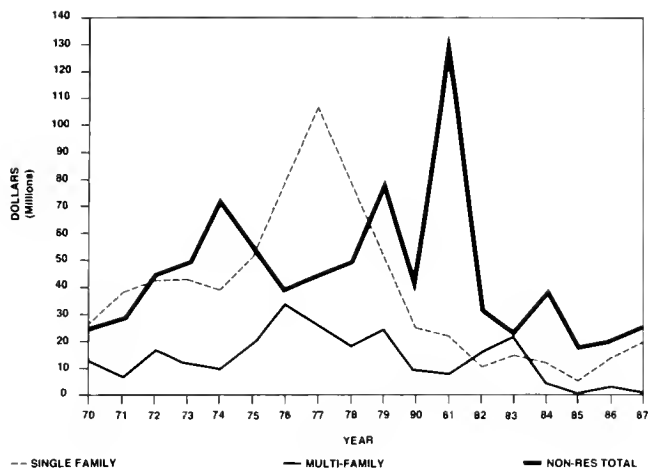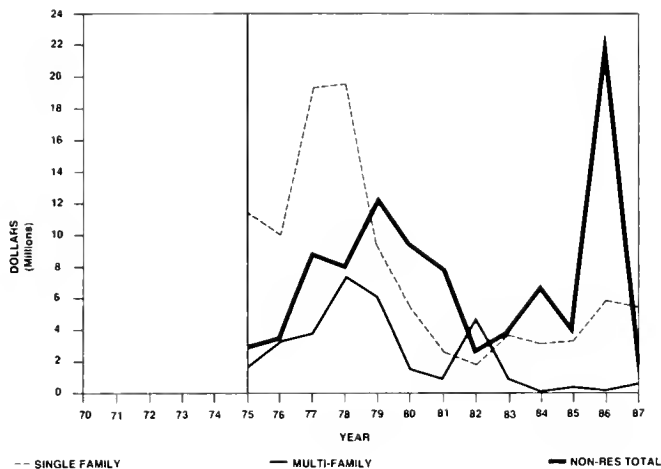
Chart 5. Peoria Building Permits

Chart 6. Kankakee Building Permits

is especially clear if one can ignore the 1981 spike as being essentially unrelated to the long-term cyclical pattern.

There seems to be a recovery underway in Peoria. But since Peoria has suffered a building depression for quite a long time, even this significant recovery will bring Peoria nowhere near previous peaks.

Kankakee

Since data for Kankakee were available only after 1974, the lag behavior can hardly be observed except that the 1975–1981 single-family permit pattern is replicated closely by the 1976–1982 nonresidential building permits. Both single- and multi-family construction was much reduced from previous levels.

Chart 6 shows a large spike in 1986. This spike in nonresidential permits in 1986 was the result of relatively more concentrated development than the one in 1979, which corresponds to the relocation of many small businesses.

One might expect some recovery in multifamily housing after a drought of many years. One might be less optimistic about nonresidential building except that Kankakee's economic link with the south Chicago suburbs may prove to be the driving force. Single-family construction should turn out to be better in 1987 than 1986, and one would not expect radical change in 1988.

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small businesses. Of course, this current recovery is on a much smaller scale than earlier peaks.

A cyclical pattern exists but is not very obvious, and the lag cannot be observed easily from Chart 4 because of the effect the two spikes have on the scale of the chart. The two residential permit types can be predicted to have recoveries, but that cannot be said of the nonresidential permits. Multifamily building has been dead for six years except for 1983 and some minor activity in 1987. It would not be unreasonable to expect some multifamily housing construction in the year ahead.

Peoria

One of the unusual facets of Peoria's record is probably the number of years that nonresidential building permits exceeded single-family building—13 of last 17 years (see Chart 5).

The time lag of nonresidential permits behind single-family permits is again observed in Peoria. This

Weakness in residential construction continued to retard the Illinois economy. The current indicator remained below the trend indicator in October and November (Chart 1). The primary cause of the downward movement has been the marked decrease in residential housing. Seasonally adjusted housing permits fell from a high of 4,801 issued in February, to 2,626 in November, a decline of 45.3 percent (Chart 2). As Chart 3 shows, the real value per building increased substantially between August and September. This increase in per building value of construction appears to be due to an increase in the construction of high-value residential housing, coupled with a decrease in the construction of low- and middle-value residential housing.

The real value of industrial construction increased by 60 percent in November, but on balance has remained fairly constant since early last year (Chart 4). The real value of stores and other mercantile construction rose in November to its highest monthly level since 1984 (Chart 5).

Although the help wanted advertising index has remained strong in Chicago and has increased in St. Louis, the Illinois unemployment rate remains above the national rate. Since September the Illinois monthly unemployment rate has increased. In contrast, the national average has continued its downward drift (Chart 6). Employment in Illinois fell by 124,000 in November, the steepest month-to-month drop in the history of labor force record-keeping in the state.

ILLINOIS BUSINESS INDEXES

	Percent Change Nov 1986- Nov 1987	Nov 1987	Oct 1987	Sept 1987	Aug 1987	Nov 1986	Oct 1986
Leading Indicator (Current Indicator)	−1.08[a]	9.63	9.69	10.49	11.68	10.71	7.98
Leading Indicator (Trend Indicator)	1.75[a]	10.35	9.85	10.92	11.06	8.60	7.17
Employment-manufacturing (in thousands)[b]	1.31%	934.6	934.1	934.4	932.6	922.5	921.4
Average weekly hours-manufacturing[b]	1.45%	41.9	41.5	41.6	41.6	41.3	41.4
Weekly earnings-manofacturing[b]	2.11%	$452.94	$448.62	$451.36	$453.44	$443.56	$443.39
Help wanted advertising-Chicago (1969 = 100)[c]	5.50%	115	115	117	120	109	105
Help wanted advertising-St. Louis (1969 = 100)[c]	0.00%	71	68	64	66	71	63
Retail Sales (in millions)[d]	1.30%	$5,903	$5,988	$5,776	$5,958	$5,827	$5,972
Coal production (in thousands of tons)	0.00%	4,201	5,750	5,542	5,226	4,201	5,440
Petroleum products (in thousands of barrels)[b]	−4.74%	1,810	2,000	1,875	1,810	1,900	2,158
Vendor performance[e]	17.86%	66%	70%	69%	60%	56.0%	54.0%
Building permits (in thousands)							
Residential housing units	−45.48%	2.273	3.008	3.065	4.616	4.169	4.087
Value of residential housing	−2.36%	$276,488	$336,511	$330,352	$318,192	$283,167	$273,180
Value of nonresidential construction							
Industrial buildings	202.17%	$40,119	$33,111	$32,512	$30,566	$13,277	$44,107
Offices, banks, and professional buildings	66.25%	$35,788	$80,276	$67,922	$33,539	$21,526	$48,283
Stores and other mercantile buildings	86.60%	$44,238	$47,094	$51,157	$34,784	$23,708	$28,208
Other	7.08%	$5,505	$8,077	$4,524	$8,677	$5,141	$4,593
Consumer price index (December 1977 = 100)							
North Central US[f]	4.59%	184.7	184.6	184.8	184.0	—	176.5
North Central/population more than 1,200,000[f]	4.55%	188.8	188.5	189.2	188.2	—	180.3
North Central/population 360,000 to 1,200,000[f]	5.00%	182.6	182.7	182.4	182.0	—	174.0
North Central/population 50,000 to 360,000[f]	5.28%	181.3	181.4	180.8	179.6	—	172.3
North Central/population less than 50,000[f]	3.15%	177.2	177.1	176.7	177.1	—	171.7
Chicago (1967 = 100)	4.35%	345.7	343.9	349.9	348.8	331.3	328.7
St. Louis (1967 = 100)	3.77%	336.0	339.5	323.8	—	323.8	
		1987·II	1987·I	1986·IV	1986·III	1986·II	1986·I
Personal income (in millions)[b,g,h]	4.83%	$188,293	$187,233	$180,304	$179,096	$179,622	$174,013
Per capita personal income[b,g,h]	7.56%	$16,165	$16,099	$15,527	$15,445	$15,029	$15,052

[a]Represents absolute change (percent change not relevant) [b]Recent month is preliminary figure [c]The Conference Board, *Help Wanted Advertising*, Nov 1987 [d]Latest month projected by BEBR [e]Percentage of companies receiving slower deliveries [f]Percent change between Oct 1986 and Oct 1987 [g]Seasonally adjusted at annual rates [h]Percent change between 1986 II and 1987 II

Chart 1. Composite Leading Indicator (Average Percent Change in Base Indexes)

-- Current Indicator   — Trend indicator
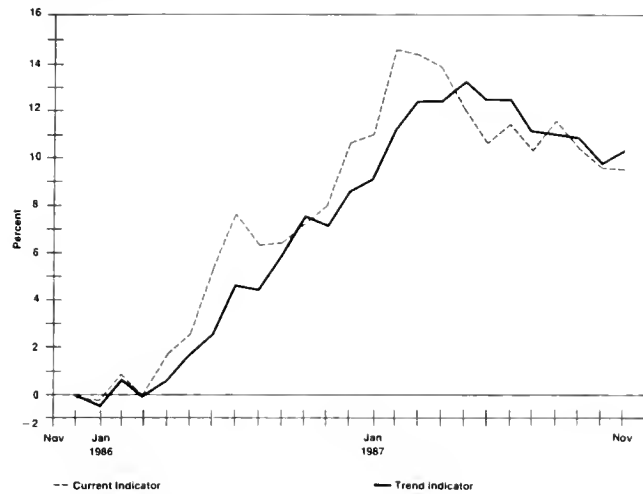
Chart 2. Housing Permits (Seasonally Adjusted)

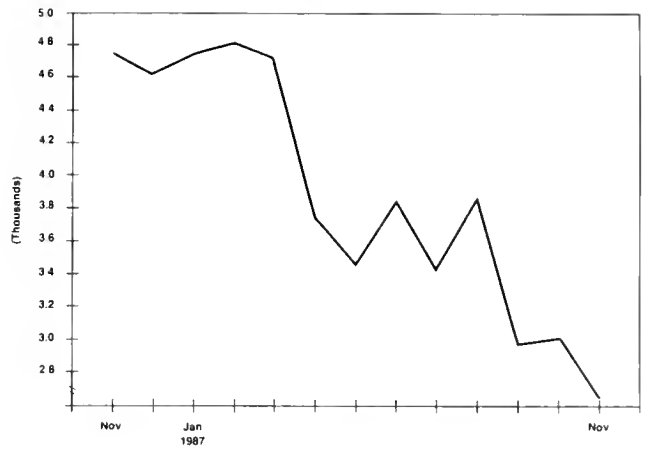**Chart 3. Real per Building Value of Residential Housing Permits (Seasonally Adjusted, 1967 prices)**
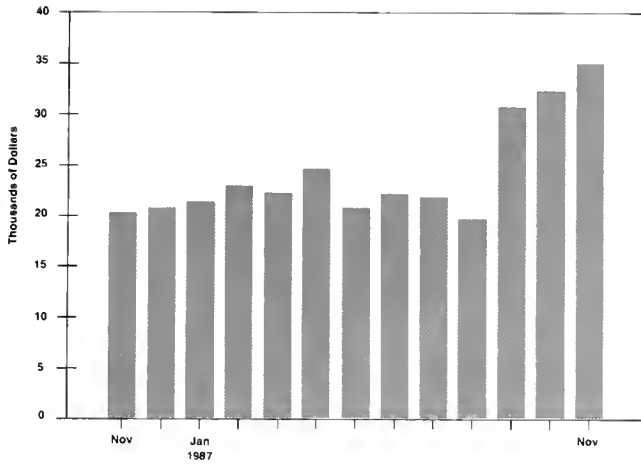

Chart 4. Real Value of Industrial Building Permits (Seasonally Adjusted, 1967 prices)
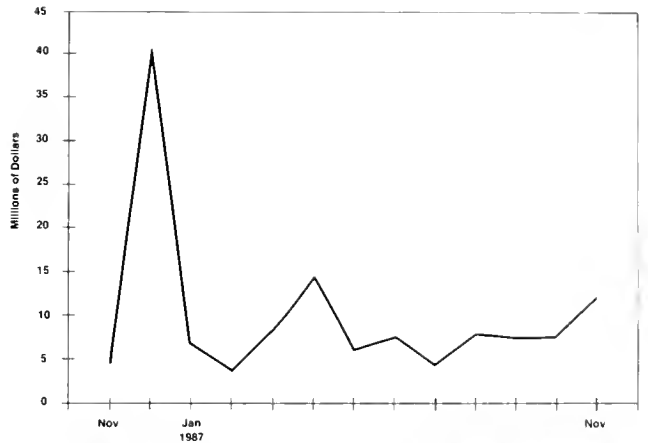

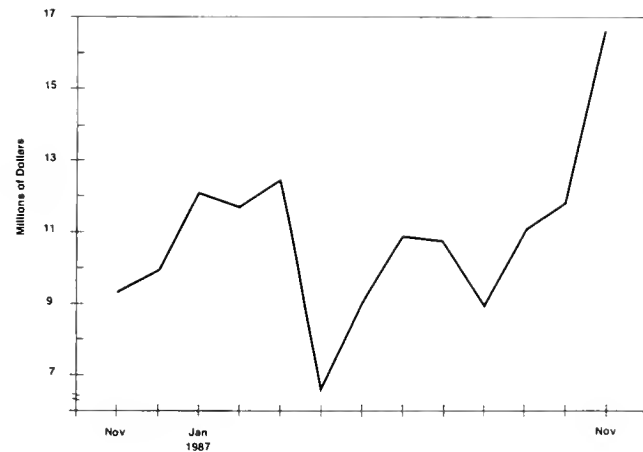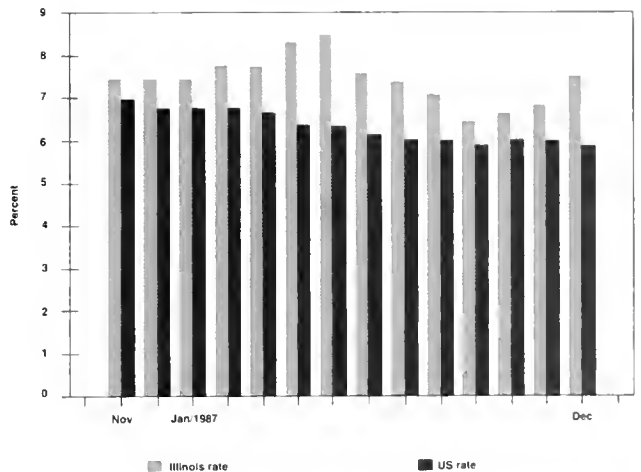**Chart 5. Real Value of Stores and Other Mercantile Building Permits (Seasonally Adjusted, 1967 prices)**

Chart 6. Unemployment Rates (Seasonally Adjusted)

Illinois rate   US rate
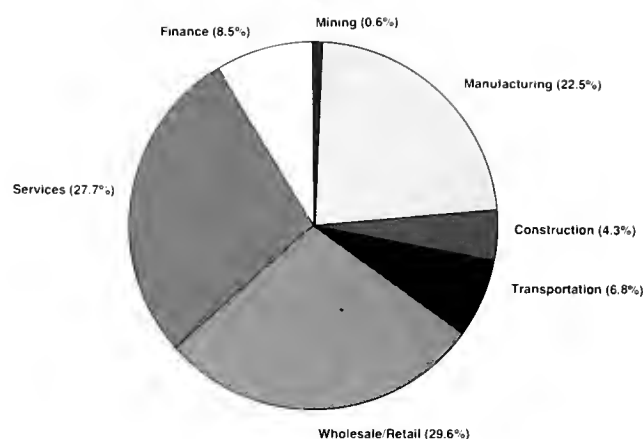
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Illinois Business Review

Illinois Economic Outlook

The Illinois Econometric Model predicts slow growth in total employment in 1988. The industries expected to experience the fastest growth are wholesale and retail trade (2.57 percent), services (2.50 percent), and the financial sector (1.90 percent). Due to their relative size, as illustrated by the accompanying chart, these sectors are an important factor in overall job growth. Positive contributions in services and trade are especially important, considering the sluggish growth rates expected in other industries. The only manufacturing sectors expected to grow over the forecast period are the chemical and primary metals industries as indicated by the table. It appears that the state's manufacturing base will continue to stagnate much as it did in 1987.

Private nonfarm employment in Illinois increased by approximately 1.7 percent in 1987, representing an additional 70,000 jobs, with most of the gain in wholesale and retail trade (3.52 percent), utilities and transportation (1.63 percent), and the financial sector (1.59 percent). With the exceptions of mining and durable goods manufacturing, all sectors experienced some increase in employment.

Illinois Employment (relative share by sector)

Finance (8.5%) Mining (0.6%) Manufacturing (22.5%) Construction (4.3%) Transportation (6.8%) Wholesale/Retail (29.6%) Services (27.7%)

Illinois Seasonally Adjusted Employment

	History				Forecast			
	86:IV	87.I	87.II	87:III	87.IV	88.I	88:II	88:III
Total private nonfarm (thousands)	4,116.0	4,054.8	4,125.4	4,152.4	4,163.4	4,166.9	4,170.0	4,175.4
Mining	24.7	24.5	24.3	24.4	24.1	23.8	23.4	23.0
Construction	182.5	183.0	174.8	177.3	175.6	172.4	169.0	166.1
Manufacturing	923.6	927.8	925.6	929.7	926.3	916.9	908.4	902.2
Durable manufacturing	562.6	564.1	561.8	566.1	563.5	555.0	547.5	542.5
Primary metals	55.0	55.4	55.4	56.1	56.4	56.6	56.7	57.5
Fabricated metals	110.5	110.7	110.9	111.9	111.1	109.1	107.4	106.4
Nonelectrical machinery	137.2	138.0	138.5	139.7	137.9	136.1	135.2	133.7
Electrical machinery	117.8	117.8	117.7	117.5	116.8	115.3	112.6	110.6
Miscellaneous durables	141.9	142.0	139.7	141.0	141.3	137.9	135.6	134.3
Nondurable manufacturing	354.5	364.6	363.7	363.1	362.8	361.9	360.9	359.6
Food products	90.3	91.8	91.7	91.0	90.8	90.7	90.6	90.3
Printing and publishing	105.1	106.8	106.7	106.4	106.3	105.4	105.2	104.8
Chemicals	56.4	56.8	57.0	57.1	57.7	57.9	58.0	58.2
Miscellaneous nondurables	107.9	108.7	108.8	109.0	108.1	107.9	107.1	106.3
Utilities and transportation	277.7	279.6	282.7	283.5	280.3	277.4	275.0	273.0
Wholesale and retail trade	1,197.1	1,209.3	1,222.2	1,237.2	1,244.2	1,251.7	1,257.7	1,262.9
Services	1,137.6	1,138.5	1,143.6	1,146.4	1,156.8	1,166.7	1,176.6	1,186.5
Finance, insurance and real estate	350.3	350.5	352.2	354.0	356.1	358.1	359.9	361.7

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William Sander and Peter V. Schaeffer

Schooling, Taxes, and State Employment Changes

There has been, with good cause, much ado regarding
the phenomena of the Sunbelt and Rustbelt, the rural
turnabout, and the decline of the cities during the
1970s. The data indicate substantial changes in the
distribution of jobs and people within the United States
between 1970 and 1980 (Table 1).

One issue of concern regarding regional economic
trends is the effect of state and local taxes. Statistics
indicate either no systematic relationship between
state and local taxes and industrial development or a
negative relationship. In any case, state and local taxes
support investments in schooling that may have
positive effects on state and local business climates.
Several studies, as well, indicate that this is the case.

In this article, we examine the effects of state and
local taxes and schooling attainment on state employ-
ment changes between 1970 and 1980. We provide
modest evidence for the hypothesis that state and local
investments in schooling enhance a state's business
climate.

The Theory

Education is an investment in human capital:
Schooling provides a foundation for the acquisition of
effective job skills. Although we recognize that
preparing students for their working lives is not the
only purpose of education, it is this aspect that is related
to the economic performance of a region or state.
Schooling improves the productivity of workers. For
example, the ability to follow written instructions or
to perform arithmetic operations is of value in many
occupations.

For the purpose of our discussion, we assume that
workers engaged in a given production process all have
the same productive potential. Differences among
workers can be attributed only to the capital stock that
they have available to work with and to differences in
their schooling.

Consider now a firm that produces something
(output). The production process requires two inputs,
labor and capital. In order to compare this firm's
demand for labor to that of a competitor in another
region, we have to take into account possible skill
differences among workers in the two regions. It is
assumed that education increases the skills of workers.

The firm is assumed to charge a price determined by
the market (to be a price taker) and to maximize profit.
Under these assumptions, the firm will hire workers
until the value of labor is equal to the wage rate. The
economic value of a worker depends on schooling. An
increase in the level of education has a positive impact

on output. The firm, therefore, is willing to pay for education. Thus, taxes do not necessarily have a negative effect on location decisions and regional employment growth.

Although it is not possible to separate the effects of education on production from its consumer value, it is possible that high education locations are attractive to industry because of consumption value. Workers may prefer to live in locations that provide better quality schooling for their children. Thus, high education locations may contribute to employment growth for both its relationship to production and consumption.

We have analyzed the determinants of the demand for labor for a particular industry. Total demand for labor in a state is the sum of the demand over all industries. It is clear, therefore, that the aggregate demand, and the growth of the aggregate demand, depend on the state's mix of industries. The specification of a model of state employment growth and schooling must, therefore, control for the effect of industry mix on employment growth.

Table 1. Employment and Population Growth Rates by Region, 1970–1980

Region	Population Growth Rate	Employment Growth Rate
New England	4.2%	20.6%
Middles Atlantic	-1.1	6.4
East North Central	3.5	14.7
West North Central	5.2	28.6
South Atlantic	20.5	39.9
East South Central	14.5	34.2
West South Central	22.5	56.2
Mountain	37.2	68.8
Pacific	19.8	43.4

Data and Specifications

Following previous research, we specified relatively simple empirical models to estimate (1) the rate of employment growth and (2) the relative differential shift in state-level employment growth between 1970 and 1980. The differential shift is an estimate of the impact of differences in industry-by-industry performance between a single state and the United States. A superior (inferior) performance of the state's industries will lead to greater (smaller) employment growth than would be expected on the basis of the state's industry mix in 1970. Thus, in the second specification we look for explanations of why state industrial performances differ from the national trends for those industries.

In case one, when we estimate state-level employment change, we have to adjust for the industry mix in 1970 because this is expected to affect the rate of employment change. In the second case, the differential shift shows state-by-state deviations from the national trend net of any effect of industry mix. Thus, in the first case, we adjust for the industry-mix effect on the right-hand side of the equation; the adjustment is made on the left-hand side in the second case. The second approach is based upon the shift-share methodology that we shall briefly review.

Because states are open economies, their performance depends on events and trends over which they have little influence. Within the United States, it is reasonable to assume that state economic performance is somewhat correlated with the performance of the national economy. The growth rate of the state economy may, therefore, be compared to that of the United States. Take state employment in the base year $(t = 0)$ and multiply it by 1 plus the national growth rate between $t = 0$ and $t = 1$. Subtract the result from the observed actual employment of the state at $t = 1$. If the state grew at a rate above that of the country as a whole, this difference is positive. It is zero if the growth rates coincide and negative if the state was lagging. In the language of shift-share analysis, this difference is referred to as the total shift.

The purpose of shift-share analysis is to separate two different effects that together make up the total shift. The first effect indicates that if a state's employment base is dominated by industries that have slow national growth rates, then one expects that state to grow relatively slowly, too. The second effect is a product of the performance of a state's industries relative to that of the same industries in the comparison region. A particular industry may grow slowly (quickly) at the national average, but it may grow quickly (slowly) in the state. Shift-share analysis provides formulas that describe these two separate effects.

The value of shift-share analysis for our analysis is clear. It allows us to separate industry-mix effects from other reasons for a state's differential employment growth. The theoretical analysis suggests that states may experience differences in employment growth for a variety of reasons. The one that is of particular interest here is education. By taking out the effect of the industry mix, the empirical analysis should yield stronger results on the impact of other factors.

An adjustment is also made for the percent of workers belonging to a union in a state in 1970 in order to reflect the possible effect of "high" union wages upon employment growth. That is, it was expected that the more unionized states are more adverse to industrial development, *ceteris paribus*. The union variable probably captures other (negative) effects, as well. In preliminary work with state-level data, we found that unemployment compensation payments per worker were highly correlated with the level of unionization. Thus, it was not possible to delineate the independent effects of unionization and unemployment compensation because of the high level of collinearity between the two variables.

State and local taxes per capita in 1970 are entered to adjust for the effect of taxes on employment. The effect of taxes is conceptually ambiguous because taxes may have both positive and negative effects on industrial location.

The percent of the population that was either 65 years or older or less than 5 is included to reflect the possible effect of relatively old and relatively young populations on employment growth. It is assumed that this variable (called age) reduces growth in labor supply, thus reducing employment growth. An adjustment is made

for the median years of schooling attained by the state's population age 25 years and older in 1970. We believe that educational attainment may enhance the economic attractiveness of a state and, thus, contribute to employment growth.

Finally, we adjust for the rate of employment growth between 1950 and 1970 (called trend). The most important reason for doing this is that changes between 1970 and 1980 are partly the product of long-term changes in the regional economic structure of the United States. Thus, long-term changes in the location of markets between 1950 and 1970 may have important effects on employment growth between 1970 and 1980.

Results

Statistical procedures are first used to estimate the rate of growth in state-level employment between 1970 and 1980 (Table 2). The results indicate that the percent union, taxes, and the percent dependents (age) have negative effects on employment. Schooling, the industry mix, and employment trends have positive effects.

Although it is not shown, the negative effect of taxes increases substantially if a schooling adjustment is made. This implies that the contribution of states and local taxes to schooling may enhance its business climate.

In general, the results of estimating relative differential shifts in employment (Table 3) are similar to the above results. One slight difference in these estimates is that the level of significance of the schooling variables is higher, thus adding more support for the positive contribution of schooling to state employment growth.

We calculated elasticities at mean values (Table 4) based on the coefficients we estimated in Table 3. The most striking result from this exercise regards the magnitude of the schooling elasticity. A 10 percent increase in schooling attainment increases the rate of state employment growth by 17 percent.

Table 2. Estimates of State-Level Employment Growth, 1970–1980

Union	− .005*
Industry mix	.025*
Age	− .024*
Taxes	− .0008*
Trend	.171*
Schooling attainment	.057*

*Statistically significant at the 10% level

Table 3. Estimates of Differential Shifts in State-Level Employment, 1970–1980

Union	− .58*
Age	− 2.95*
Taxes	− .10*
Trend	19.59*
Schooling attainment	14.30*

*Statistically significant at the 10% level

Table 4. Elasticities at Point Means

Variable	Sign	Elasticity
Union	−	.3
Industry mix	+	.1
Age	−	1.1
Taxes	−	.8
Trend	+	.3
Schooling attainment	+	1.7

Conclusions

State employment changes during the 1970s were affected positively by the level of schooling in states in 1970. If an adjustment is made for schooling, the effect of taxes on employment is negative. As is noted, the magnitude of the tax effect declines substantially if an adjustment is not made for schooling. The most plausible reason for this is that state and local taxes that are invested in schooling have increased the stock of human capital in a state and, subsequently, the state's attractiveness to industry.

Employment trends in a state before 1970 were shown to be positively correlated with changes between 1970 and 1980. One plausible reason for this is the relocation of markets within the United States over time.

The industry mix in a state in 1970 had some bearing on employment changes during the 1970s as would be expected. States with a higher share of low-growth industries did not do as well as states with a higher share of high-growth industries.

Increases in unionization tended to adversely affect employment growth. In addition, relatively fewer jobs were created in states with a very young and/or very old population.

In closing, we would note that our results do not necessarily imply that additional spending on schooling in the future will necessarily improve a state's business climate. We believe this to be the case if, and only if, the additional expenditures result in better schools.

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Marvin J. Barloon

The Diversion of Great Lakes Water to the Arid West

"The United States ... is running out of its most indispensable commodity. That commodity is clear, usable water." So warned Congressman Jim Wright of Texas in his 1966 book, *The Coming Water Famine.* For the nation as a whole, there is no present cause for alarm. But, for some regions, the alarm is already sounding. The "water famine" has been troubling the Colorado River Basin for a long time. By the end of the century, the famine will also be felt with rising severity in sections of the High Plains, that is, in the north-south column of states east of the Rockies, from Montana down into western Texas.

The abundant waters of Illinois are directly involved in this prospect. The dwellers of the Colorado Basin and the High Plains are beginning to eye the Great Lakes for relief. William Busten, Director of the Center for the Great Lakes, told the meeting of Great Lakes governors in 1983 that little doubt remains but that, as water supplies tighten in the coming years, the western states will look to the Great Lakes as a potential new source.

The Great Lakes constitute the largest body of usable fresh water in the world. They contain an estimated 5,473 cubic miles of good water, enough to inundate the entire United States to a depth of eight feet (including Alaska and Hawaii). Probably the most feasible outlet for channeling lake water westward is the connection at Chicago between Lake Michigan and the Illinois River, which in turn connects with the Mississippi at Alton.

Proposals for such diversion have not yet jelled, but the matrices are in place. In 1976, Congress enacted Public Law 94–586, providing for a comprehensive survey to include possible importation of water in the West. The 1982 report of the "High Plains Study Council," representing the governors of six western states, contemplates transfers from other basins. In its 1984 report, the "Texas 2000 Commission" recommended development of a plan for options for interstate and even international transfers of water.

In 1985, the governors of the Great Lakes states and Canadian provinces formalized the Great Lakes Charter, in which each pledges to consult the others and to seek joint action before authorizing any further diversion of lake water. But this is not enough. Developments in the arid sections of the West may well proceed without explicit reference to the Great Lakes until a culmination is reached under which diversion form the lakes would become almost irresistible. It is, therefore, important that Great Lakes interest give close attention western water problems and programs and to their long-term implications, even though in their initial stages such programs may seem irrelevant to the lakes, and that lake interests be heard long before the emergence of any direct threat to their waters.

The Ogallala Aquifer

Depletion of the Ogallala Aquifer, at present a major reserve of High Plains water, may well precipitate the issue. This aquifer consists of ground water lodged in subsurface porous rock and sandstone, feeding wells drilled mainly for irrigation. The Ogallala Aquifer extends all the way from Wyoming down into western Texas, underlying an area over three times the size of Oklahoma.

The High Plains are literally mining this deposit. The US Water Resources Council reports that the amount of water pumped from the Ogallala in 1975 exceeded replenishment by nearly one-third. The Council adds, "In some of these (High Plains) areas ground-water levels are declining from seven to ten feet per year."

As this continues unabated, the ever-deeper wells will gradually become prohibitively costly. Ground water moves slowly. It would take centuries to replenish the Ogallala.

High Water on the Lakes

By contrast, the Great Lakes now have too much water—at least for many lakeside dwellers. Wave action is washing away beaches and undermining shore properties. A survey of erosion and inundation damages by the Army Corps of Engineers for the period, 1972–1976, revealed losses of over $73 million on the south shore of Lake Erie alone. In 1987, the losses were greater. At first sight, it might appear logical to transfer some of this excess water to the West, to the mutual benefit of the two regions.

But, the benefits would be temporary at best. Lake levels vary unpredictably over periods lasting from three to ten years. For example, from 1960 to 1964, the surface of Lake Michigan fell about three feet. The next nine years it rose five feet. These fluctuations are a normal response to changing precipitation in the lakes basin. For this reason, periodic high water on the lakes cannot provide dependable help in the High Plains or the Colorado Basin. Excessive lake levels do not synchronize with western needs. The most severe drought in the West occurred during the Dust Bowl years of the 1930s when lake levels were the lowest in the 20th century. Clearly, the West could not turn its water use on and off in response to changing lake levels, unpredictable both in occurrence and duration.

Great Lakes Vessels in Shallow Channels

Unhappily, therefore, we shall almost certainly be confronted with an interregional conflict of interest. Indeed, the conflict will be international. All the lakes except Lake Michigan are boundary waters, and our Canadian neighbors would bear a share of the cost while reaping little or nothing of the benefits.

Diversion would add to the cost of lake shipping in both countries. The tonnage of freight carried on the Great Lakes and the St. Lawrence Seaway annually is about equal to that of the two ports of New York and Philadelphia, combined. The Chicago area moves more of this freight than any other US lake port. Great Lakes traffic underlies much economic activity all the way from the Missouri River to Montreal.

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What difference would a few inches make to ships breasting 25-foot billows on the stormy lakes? Lake Superior is over 1,300 feet deep. The answer is: little or none on the open lakes. But, the inches count in the channels leading from one lake to another and in the ports. During high-water years, the lake-to-lake channels are normally limited to a draft of about 27 feet, equivalent to that of the St. Lawrence Seaway. Dozens of smaller lake ports are limited to lesser drafts, even in their main channels. Monroe, Michigan, for example, is limited to vessels of a 20-foot draft, and Rochester, New York, to 24 feet. By way of comparison, the limited drafts in the main channels of the Port of New York lie in the range of 35 to 45 feet, of New Orleans, of 36 to 40 feet.

In 1977, the water level in the Great Lakes connecting waters had fallen about 12 inches from that of 1976. N. Terry Burton, fleet manager for the Inland Steel Co. of Chicago, said that, in consequence, some of the ore vessels of his firm were loading 2,000 tons less at a cost of some $8,000 per trip. For a heavy commodity, such as iron ore, every one-inch drop in the water level means that a vessel's cargo is reduced in the range of 100 to 200 tons. At 1977 carrier rates, a mere two-inch diversion of lake water to western lands would have increased the $8,000 cost cited by Mr. Burton to nearly $9,500 per trip.

Although shrunken in recent years, the steel industry reliant on Great Lakes ore shipments remains very large. In 1986, steel works in the Great Lakes states, dependent principally on lake and Seaway ores, produced about as much steel as all of France and West Germany combined and employed some 130,000 workers.

Extensive coal mining communities, farm regions, and railroad systems would also feel the impact. The coal shipped on the Great Lakes in 1986 was equivalent to the output of about 11,000 Appalachian miners, and the low cost of lake coal held electric bills in check all the way from Montreal to Duluth. Lake-borne grains and soybeans represent yearly farm revenues of about $2.0 billion—mostly Canadian. Shallower lake channels would also shrink railroad revenues. Most of what moves on the lakes originates or terminates by rail—coal from Kentucky, West Virginia, Pennsylvania, and Montana—grain from farm regions as distant as Manitoba, Nebraska, and the Dakotas.

Although dominated by a few bulk movements such as these, lake commerce is quite diverse. The Army Corps of Engineers reports 50 different commodities carried on the Great Lakes in yearly quantities exceeding 100,000 tons each. Many of these also traverse the St. Lawrence Seaway. The Seaway is already contending with a problem of reduced traffic. Seaway transits peaked at 63.3 million tons in 1977, but, in the mid–1980s, had fallen back to around 50 million tons yearly, with a corresponding impairment of toll revenues.

Hydropower on the Laurentic Rivers

Nor would the impact of diversion be confined to shipping. Great Lakes water pours through the Turbines of three great hydroelectric centers, one near Niagara Falls and the other two on the St. Lawrence Seaway. These three, combined, have a capacity equivalent to one-quarter of the New York State total. The Niagara Power Project, alone, provides about 14 percent of all the electric energy consumed in that state.

These stations have a dedicated constituency. They are all operated by public power authorities, that of New York State and those of Ontario an Quebec. They withdraw no water; they consume no fuel; they discharge no air pollutants; and they involve no nuclear hazard. Diversion would significantly reduce the flow

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The Ogallala Aquifer, the Western Rivers, and the Great Lakes
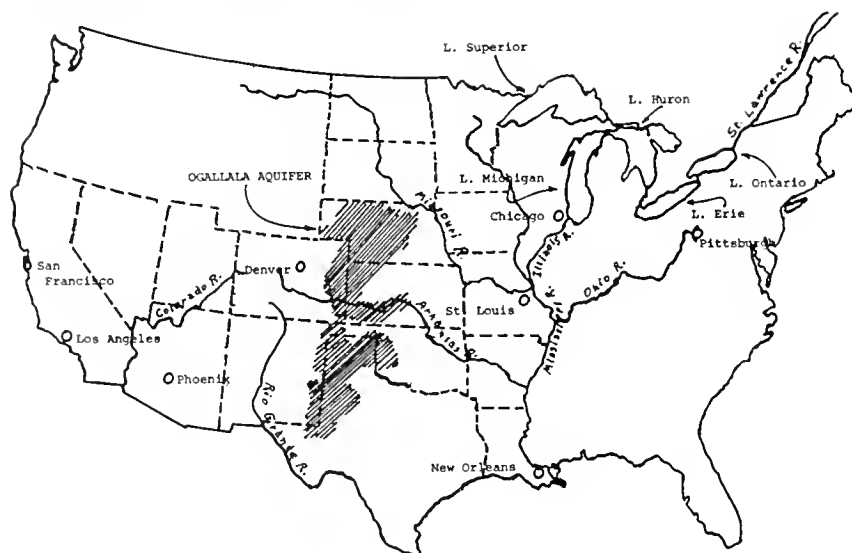
of the waters powering these stations and would have the same economic effect as an uncompensated dismantling of some of the installed capacity. Such a levy would not be received in silence by the millions of households in the service areas.

Diversions Accomplished

Piecemeal diversions of lake water have been in effect for a long time. In 1848, the busy canal diggers of the era initiated the diversion at Chicago from Lake Michigan into the Mississippi Basin via the Illinois River. This seepage continues at irregular rates, by order of the US Supreme court not to exceed an annual average of 3,200 cubic feet per second (cfs). This and other punctures in the system represent a net outflow of about 5,000 cfs, equal to roughly one gallon out of every 40 that pour over Niagara Falls. Not much, but the precedent is there.

Water Use versus Water Consumption

Diversion to the High Plains would add substantially to the nation's water consumption. The principal uses of lake water—shipping, hydropower, and recreation— do not even involve withdrawals, and most withdrawals from the lakes for such uses as manufacturing, power generation, and municipalities, are offset by discharges. What comes out the faucet goes down the drain and back to whence it came. Manufacturing, on the average, returns to the lakes and streams about 89 percent of what it withdraws. The water is, thus, available for reuse by lower-lakes communities, and its use is a problem, not of sufficiency, but of pollution control.

But, water use on the High Plains is mostly agricultural, and farming is not only a water user, it is a hugh water consumer. What comes out the faucet goes, not down the drain, but into animals and plants and off into the atmosphere. Virtually 100 percent of animal ingestion is totally lost. In the Missouri Basin, 85 percent of all water withdrawn is for irrigation, and, of this, about 45 percent is lost.

Nationwide, the rising consumption of water is a matter of growing concern. The supply is fixed by the yearly precipitation of rain, hail, and snow. It is no greater now than when the Constitution was adopted in 1789. The country was then home to only 3.9 million people. Now, 241.5 million are drawing on that supply. And every year we are consuming more water per person. Diversion from the lakes to western irrigation would advance the day of nationwide reckoning.

Paradoxically, relative to their population, the arid High Plains are much bigger consumers of water than the rest of the country. In 1980, the daily withdrawals from all sources in the four states of Nebraska, Kansas, Oklahoma, and Colorado averaged 3,685 gallons per person. The national average per capita was only 1,953 gallons, and that of the Great Lakes states only 1,368.

The Mirage of Pipelines to the Colorado Basin

Possible transfer from the lakes to the Colorado River Basin (centered on Arizona and Utah) presents difficulties so extreme as to be hardly credible. Not only is the Colorado Basin too far away. (The overland distance from Chicago to Phoenix is about 1,500 miles.) The Basin is also much too high. From the Mississippi River Westward, the land slopes upward to a high plateau. The level of Lake Michigan at Chicago averages about 579 feet above sea level. Much of eastern Arizona exceeds 5,000 feet; the average elevation of New Mexico is 5,700 feet and of Utah 6,100 feet. Water from Lake Michigan for the Colorado Basin would thus require an enormous system of pipelines carrying pumped water under pressure.

The largest oil pipeline in the United States is the 40-inch diameter Capline, running from southern Louisiana to central Illinois. Capline's capacity is about 1.2 million barrels per day. Daily water withdrawals in the Colorado Basin now approximate 376 million barrels. To provide just 5 percent of the Basin's withdrawals would clearly require about 16 Caplines.

Such an undertaking would be comparable to pumping the entire Chicago River a vertical height of about a mile while transporting it horizontally some 1,500 miles. On the way, the water would have to be bridged over the Mississippi, the Missouri, and a number of lesser rivers, all flowing downward beneath the unbound water from the lakes. In addition to the capital outlay running into double-digit billions, interminable operating and maintenance costs, including huge energy expenditure, would be beyond precedent in a peacetime undertaking.

Pipelines to the High Plains

Neither, in all probability, could any project for direct transfer from the lakes to the nearer High Plains east of the Rockies be economically justified. Elevations in the High Plains fall generally in the range of 2,000 to 3,500 feet, representing a lift from Chicago of some 1,500 feet or more, comparable to the height of the Sears Tower. Volumes would approximate those cited for the Colorado Basin.

With respect to most of the existing federal reservoir projects in the West, the Bureau of Reclamation established justification by merging the prospective and abundant hydroelectric benefits with those of irrigation in a general project account, so that irrigation received a largely free ride as a species of by-product. By contrast, hydroelectric credits could not help a prospective transfer from the Great Lakes. Whatever hydroelectric potentials might be found in the project, the offsetting hemorrhage of energy in pumping Great Lakes water upgrade would grossly outweigh the credit. Furthermore, any valid benefits-cost analysis of direct transfer would require inclusion of the costs to the economy of the Great Lakes region, a handicap absent from the earlier evaluations of existing western works.

Proposals for direct pumping from the lakes, either to the Colorado Basin or the High Plains, will probably be advanced. But, if so, they will be irresponsible and

should not receive much of a hearing. Dr. Allen V. Kneese, Senior Fellow of the Quality of the Environment Division of *Resources for the Future*, comments:

> Even a cursory look at the economics of imported water starkly reveals what an outlandish idea it is . . . water importation is a thoroughly bad idea, even if just the economics are considered; imagine an environmental impact statement for such a project.

Replenishing the Mississippi

There are, however, other and more plausible scenarios. Forthcoming proposals, of course, cannot be forecast in their particulars. Therefore, let us select one with as favorable an outlook for economic and political feasibility as is likely to be devised. If this scheme cannot qualify, it is hard to imagine any that can.

First, we may as well dismiss the Colorado Basin as a candidate for Great Lakes water. Plans have already been hatched there for drawing further on the waters of northern California and the Pacific Northwest. Instead, let the lake waters play an indirect role in serving the less-distant High Plains east of the Rockies, there to compensate for the decline of the Ogallala Aquifer.

The direct source of new waters for the High Plains might well be their own rivers, that is, the western tributaries of the Mississippi, principally the Missouri and the Arkansas. But, too large a demand on these tributaries would leave a deficiency in the main stream of the Mississippi. Enter, the Great Lakes. Any deficiency in the Mississippi could be corrected by increased releases from Lake Michigan at Chicago via the Illinois River.

A plan of this kind would appear less "outlandish" and would, therefore, have a better chance of adoption. New dams on western tributaries, such as the Platte or the Upper Missouri would be at elevations approximating those of the fields their impoundments would water and so would require only limited pumping. Distances would be short. The existing Garrison Reservoir in North Dakota, for example, is at an elevation 1,264 feet higher than Chicago. Nature has already done the pumping.

But, do the Missouri and its tributaries have any water to spare? The western basins are afflicted with alternating drought and devastating floods. Flows are, thus, wildly variable. If these rivers have water to spare, it will have to be captured behind dams during the flood seasons and gradually released when the flow subsides.

The Missouri, the Arkansas, and their tributaries are already among the most dammed rivers in the world. Yet, the presumption is very strong that they still have dam sites with water to spare. In 1985, the Missouri discharged 59.9 usable acre-feet into the Mississippi near St. Louis, nearly three-fold the total water withdrawals on the High Plains. Airline travelers from the east, flying over the Mississippi on their approach to the St. Louis airport, may note the wide band of muddy water hugging the west bank. They are looking at Iowa and Nebraska real estate brought downstream by the Missouri. There are now no dams on the Missouri below Yankton, South Dakota, 811 river miles above the mouth, and most of the discharge at St. Louis is precipitation from this reach.

Additional dams and other works on the Missouri River and its tributaries, upstream from Yankton, are already under consideration. The proposed Fort Benton Dam, High Cow Creek, and the O'Neill projects are illustrative. The Garrison Diversion project in North Dakota would provide more water for irrigation. The construction of a new dam at The Narrows on the South Platte, a major tributary of the Missouri, or at the confluence of the South Platte and the North Platte remains under evaluation. Others might be cited.

Admittedly, dam building in the West has been slackened in recent years. This is largely because of western resistance to the higher charges for water use and to increased local financing urged by the Reagan administration. But, the growing shortage of water may weaken this resistance, especially with the possible return for a few years of Dust Bowl conditions. Indeed, the project at the confluence of the South Platte and the North Platte Rivers would be built by the Denver Water Board, a financing somewhat harmonious with the Reagan policy.

It appears, therefore, that the Missouri and its tributaries still have water to spare to be caught by more dams in high-water seasons, either in the reach below Yankton or in the higher elevations where such projects are already on the drawing board.

The Middle Mississippi

The potential adverse impact on waterborne commerce on the Mississippi is substantial. The muddy band from the Missouri helps the Mississippi carry an enormous tonnage of freight. The Middle Mississippi extends southward from the Missouri's mouth 195 miles to Cairo, Illinois, where the huge Ohio River pours into the Mississippi a mass of water large enough to correct most deficiency from there to the Gulf. The metropolitan area of St. Louis, with a 1984 population of 2.4 million, fronts on the Middle Mississippi, including, on the Illinois bank, one of the nation's major oil refining centers. The governing channel draft in this reach in nine feet, and any substantial shortfall would be a matter of national concern.

The Middle Mississippi is one of the most densely used waterways in the world. Moving traffic 12 months of the year, in 1985 it carried 18,421 flotillas of barges, averaging 5,031 tons of cargo each—mostly long halls—and connecting such cities as Minneapolis, Pittsburgh, Kansas City, Chicago, New Orleans, and Houston in a continuous flow, including in its cargo export grain, coal, petroleum fuels, chemicals, fertilizers, building materials, steel, and a wide variety of processed and fabricated products. The total tonnage carried was more than twice that on the St. Lawrence Seaway and growing.

The flow of the Mississippi is also a bulwark against excessive salinity in Gulf coastal waters. The low-lying city of New Orleans is especially vulnerable, and it is reported that releases from as far away as the Fort Peck

Dam on the Missouri in Montana have served to repel costly salt water intrusion in the New Orleans water supply.

Small diversions from the Missouri to the High Plains would not significantly affect the navigable draft in the Mississippi. But, large ones would be very serious, especially in years of low water. As depletion of the Ogallala Aquifer continues, compensating diversions would become progressively greater and could well pose a crisis not long after the turn of the century. If diversions from the Missouri River had replaced the Ogallala withdrawals in 1963 (a low-water year), the Missouri's discharge at St. Louis would have been reduced by about 38 percent. Even in 1985, a high-water year, this reduction would have been 18 percent. The effect on shipping draft of such reductions, or of even larger ones in years of unpredictably low water, would impose shipping costs on most of the Mississippi Basin and the Gulf Coast running into many millions of dollars.

This is the damage which might be averted by additional releases from the Great Lakes. An attendant problem would be that of flood control on the Illinois River. In low-water seasons on the Middle Mississippi, the withdrawal from Lake Michigan at Chicago could well reach 15,000 to 20,000 cfs, in comparison to the present yearly average of 3,200 cfs, posing a flood hazard for downstream communities and farm lands. Therefore, a sound evaluation of diversion from the lakes should take into account, not only the higher lake shipping costs and the impairment of hydropower we have noted, but also the cost of additional flood control on the Illinois.

Alternatives to Diversion

We appear, then, to be confronted by a dilemma. Diversion from the lakes would impose severe costs on the lakes region. But, with depletion of the Ogallala, western farmers are facing progressive aridity of their lands. Water is a necessity of life. Congressman Wright says: "Pure water, when and where you need it, is worth whatever it costs to get it there." Should not the lakes be required to accept the costs in order to avert disaster in the West?

But, in the West, the alternative to diversion is not actually disaster. The sinking water table of the High Plains is a slow process; Ogallala depletion is widely recognized; and ample time is thus available for adjustment. Other sources of water remain. The average yearly precipitation in eastern Colorado, for example, is 16 inches—about one-half the national average. The numerous reservoirs built by the Bureau of Reclamation and other agencies since World War II now capture and distribute more of this runoff for farm use than ever before.

Irrigators on the High Plains can use water more sparingly without equivalent loss of production. Present federal subsidization rewards profligacy. The National Water Commission observes, "The water users on some modern Federal Reclamation projects, for example, repay no more than 10 percent of the construction costs attributable to irrigation."

With water virtually free, irrigation management concentrating on the "bottom line" has little incentive for thrifty application. Present spraying systems entail large losses to evaporation and, applied to row crops, feed water unproductively onto muddy ground. Crops requiring large quantities of water per dollar of value are cultivated where more water-thrifty crops could grow. In some areas, irrigation could be reduced to a supplemental role. Admittedly, over the long run, some acreage would have to return to less-rewarding dry farming and some reassigned to grazing. The adjustment would not be costless, but it need not be disastrous.

In a national perspective, no future shortage of foodstuffs or fibers presently discernable can justify transfers from the lakes. The crops flourishing on Ogallala waters include cotton, alfalfa, wheat, sugar beets, corn, and sorghum, some of these overflowing the nation's storage bins and subject to price supports and output controls. Indeed, subsidized reclamation projects on the High Plains are damaging to farm interests in the better-watered regions of the country, such as the Corn Belt, depressing farm prices with excess supply.

Monitoring Western Developments

Spokesmen for lake interests may fail to perceive the implications with respect to the Great Lakes of a program along the lines of the one we have sketched. The program would proceed over many years. In its initial and intermediate stages, it would bear no ostensible relationship to the Great Lakes. Proposed new dams on the Missouri and its tributaries are in the distant West and in another drainage basin. Even the prospective threat to navigation drafts in the Middle Mississippi would not be readily evident, concealed in the uncertainties of flow variation. At the extreme, flows on the Missouri vary as much as 200-fold, whereas both official project evaluation and public discussion tend to focus on normal, recent, or average discharges.

But, at a later date, after completion of a number of the Missouri River works, the inevitable arrival of a season or a series of seasons of western drought and consequent low water on the Middle Mississippi, with its attendant damage to the river's commerce, would at last engender pressures for increased releases at Chicago. By this time it would be too late for opposition to the High Plains dam-building program. The dams would already be in place, and the conflict would have moved downstream, pitting the interests of Mississippi shipping directly against those of the Great Lakes. The western irrigators could stand aside as uninvolved. They would have their water.

Water resource issues are no longer local—nor even regional. Impacts reach for thousands of miles. Releases from the Fort Peck Reservoir in Montana freshen the drinking water in New Orleans. Water originating from a summer shower in Duluth pours through penstocks in Quebec. The massive tonnages of freight transiting the lock-and-dam structures on the Ohio near Cairo, Illinois, weave the distant industrial complexes of Pittsburgh and Houston into an integral logistical system.

Whatever concepts of relief may emerge, no matter how modest their scale, the Great Lakes communities cannot afford to disregard developments on the western plains. In association with increased interbasin connections, the water resources of North America progressively merge towards a single lode of continental dimensions. The High Plains farmers are beginning to eye the Great Lakes, and the people of the Great Lakes region would do well to return their scrutiny.

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Kalman Goldberg and Robert C. Scott

The Effect of Property Taxes, Public Benefits, and Amenities on Neighborhood Housing Prices

This article summarizes a study done to estimate the impact of property taxes, selected public services, and amenities on the price of single-family residential housing in a city.

A common observation, formalized in economic theory, suggests that gains from differences in property taxes and benefits associated with particular municipalities are short-lived. Careful searchers among potential buyers of single-family residences note these disparities. The high demand for the bargain properties, in those municipalities in which taxes are low relative to benefits, raise their prices. The saving in tax payments are offset by the loss of future income from the capital invested in the higher priced property. The obverse occurs in the high tax/low benefit municipalities. This market process of capitalization has the long-run consequence of eliminating disparities. In brief, you get what you pay for as people "vote with their feet" and, thus, alter housing prices.

Economists have conducted numerous tests of this process to determine whether some of the differentials in housing values among cities can be explained by differentials in property taxes and the level of local government expenditure. With virtually no exceptions, these studies took municipalities as their subject. They compared tax rates and benefits in each during a given year or in some cases in two years. They estimated "coefficients of capitalization," the price differential resulting from differences in a dollar of property tax per standard unit of housing or from a dollar difference in expenditures for provision of public services.

Our study differs in important respects. It poses some different questions, offers some different conclusions, and uses a somewhat improved methodology. We do not take the municipality as the unit of our observation. Instead, our interest is in determining how housing prices in different neighborhoods are affected by the same tax and benefit actions of their common political jurisdiction. Does capitalization remove the fiscal disparities *within* a city, or are high- and low-income neighborhood housing prices affected differently? If so, are there revenue sources other than the property tax that might narrow the differences that offer more equal treatment?

The jurisdiction selected for the study is the city of Peoria, Illinois. Its population during the study year was approximately 124,000. It is comprised of a wide range of income classes and diverse neighborhoods. Blacks make up about 19 percent of the population and hold about 8.5 percent of the owner-occupied dwellings. Socioeconomic segregation by neighborhoods was, and remains, marked. The data base is comprised of all the 817 individual single-family residences sold during

1979 within the city. Each house is assigned its own structural characteristics, the characteristics of the census tract neighborhood, and high school attendance area in which it is located.

The Capitalization Relationships

The study tested the following relationship. The percentage change in the selling price of a single-family residence depends on changes in effective property tax rate, net of shifting (an increase in the tax rates reduces price); the average score on the college entrance examination (higher scores raise price); the average use of the main and branch libraries (higher use raises price); the percentage of nonwhite residents in the census tract (higher percentages lower price); the crime rate in the neighborhood (high crime rates lower price); and the bundle of housing characteristics of each single-family residence in the sample. Amount or quantity of housing is measured as multiples of the structural characteristics of each residence. This permits the isolation of the differences in the structure or quantity of house from other variables that influence its prices, such as location.

The sale price of the house in 1979 is its market value. Data on selling prices and individual housing characteristics were provided by the Multiple Listing Service (MLS). The study uses a micro data base, the sample including every single-family residence sold in the city in 1979.

The effective tax rate is the actual dollar amount of tax levied, adjusted for shifting as a federal personal income tax deduction, as dollars of tax per $1,000 of market value of the house. The dollar amount of taxes were taken from the MLS records for each house sold in the area. The Internal Revenue Service provides data on marginal tax rates by adjusted gross income classes. It also provides data on the percentage of each income class that itemizes property taxes as a deduction. The income of each household was assumed to be that of the average income of its census tract of residence. The appropriate marginal tax rates were assigned to residences in the study in all the tracts. This marginal rate was adjusted by the percentage in that income class that actually itemized the property tax. The effective tax rate, then, is derived with the dollar tax levy reduced by the amount shifted. Failure to make this adjustment, increasingly important as income and housing values rise, would exaggerate the true tax cost and bias the capitalization rate.

All else equal, a higher property tax rate reduces value. The actual dollar effect on price depends on the size of the coefficient and the individual characteristics of the house and its neighborhood.

The average ACT score for each of the city's four high schools was provided by the school district. The high school attendance area of each residence is part of the MLS data, thus high school ACTs were associated with each house. The school boundaries are much larger than census tracts and are, therefore, less homogeneous. Nevertheless, the quality differences are significant and are so perceived by residents. The expected sign on ACT is positive—higher quality high schools attract buyers to their attendance areas, raising housing values.

Data for library use were collected by a survey of all users during four weeks at separate times of the year. Addresses of users were sorted by census tract and the tract average library use was assigned to each house within the tract. The coefficient is expected to have a positive sign. It is a desirable service for higher income families who can be expected to pay more for a house where library services are available. On the other hand, low income families, infrequent users of the service, are not expected to be willing to bid up the price of a house because there is a good library service.

Data on racial composition are those reported in the 1980 Census of Population. Each house was assigned the nonwhite percentage of its census tract. The neighborhoods with high concentrations of black residents are also the older and poorer residential areas. The residences of higher income blacks are distributed in the community at large, and whatever racial prejudice exists is diluted. It is expected that a higher percentage of nonwhite residents would have a negative effect on price.

Data on crime were provided by the Peoria Police Department from their computer records of police calls. These were sorted by census tract. Each house is assigned the crime rate value of the census tract in which it is located. It is expected that the coefficient measuring the effect of neighborhood crime on housing prices would be negative. One would not expect families to be willing to pay more for a house because their taxes are going to support a high level of police activity in response to a high crime rate in the neighborhood. On the contrary, the disamenity would be capitalized as well as the tax to pay for the police.

The specific structural characteristics of each house are included in the regressions as 31 separate variables. The data were part of the MLS information on each house sold. The inclusion of this rich store of data avoids bias errors in the estimation of capitalization effects of the variables identified earlier.

As the explanation of these variables suggests, their effect on housing prices is more complicated than prior aggregate tests indicate. Some publicly provided services (for example, libraries) are clearly superior goods but the demand for them and their influence on housing demand is positively correlated with income. In contrast, some services are inferior goods (for example, police services that are positively correlated with high crime) and their use, not through choice, is inversely related to income. Based on these considerations, one would expect the empirical analysis to demonstrate that the net effect of capitalization of taxes and public services is to lower the price of a unit of housing more in the poor neighborhoods than in the higher income ones.

In summary for poor neighborhoods: (1) Crime (greater use of police services) lowers price. Tax cost for police services lowers price. There will be a larger relative effect in poor neighborhoods with low income because of their lower marginal tax rate for property tax deduction; (2) Library: little used and, therefore, little positive effect on price. Tax cost lowers price,

same as 1; and (3) High school: poor quality school with little or no positive effect on price. Tax cost lowers price, same as 1 and 2.

For high-income neighborhoods: (1) Crime (little use of police services), little positive effect on price. Tax cost lowers price, but tax cost dollar-for-dollar relatively less due to more shifting; (2) Library: higher use raises price. Tax cost lowers price, same as 1. However, tax cost is further reduced by cross subsidy from lower income households who are taxpayers but nonusers; and (3) High school: high quality, raises price. Tax cost lowers price, same as 1.

Empirical Test of Neighborhood Capitalization

The results of the testing are presented in Table 1. They confirm the anticipated results of the effect of each of the independent variables on the price of a standard unit of housing. Also confirmed is the differential impact of these variables depending on neighborhood location of the house. As expected, the effective tax rate had a negative effect on price and was statistically highly significant.

The coefficients of benefits, high school quality, and racial composition estimate changes in housing value associated with percentage changes in each of these variables. The actual net capitalization effect of tax payments and the use of publicly provided services (inferior and superior) varies within the city jurisdiction. Prices for a standard unit (a standard quantity isolated from other than structural influences) of housing are higher in the higher income neighborhoods and lower in the poorer ones. This is, in part, due to the cross subsidy that exists due to the fiscal disparity between the after-shifting tax payments (negative capitalization) and the net benefits from superior (positive capitalization) and inferior (negative capitalization) characteristics.

Table 2 contains data for hypothetical low-, middle-, and high-income households and estimates of the net capitalization for each computed as the offsetting effects of tax capitalization and benefits capitalization. Income, the effective tax rate, and other data for household number 1 are based on averages for census tract 2. Household number 1 has $13,984 of income. Its effective tax rate is 15.60. This rate was computed as the average dollar amount of property tax paid per $1,000 of selling price for homes sold in tract 2.[1] Household 1 shifts .043 of its property tax to the federal government as a federal income tax deduction, leaving a net effective tax rate of 14.93. The capitalization effect of net taxes paid is based on the city-wide capitalization regression coefficient, which was then applied to household 1. Relatively minor assessment imperfections aside, the capitalization effects among the households are due to the differences in their ability to shift part of their tax burden to the federal government. As shown in Table 1, each dollar of net effective tax rate reduces the natural logarithm of the house price by .0303. Alternatively, a $1 increase in the property tax rate from $14 to $15 (per $1,000 of value) reduces the property value by almost 3 percent. The impact of

the full 14.93 net tax rate reduces the price of the house by 36.4 percent. The net capitalization rates of taxes for all three household types are shown on line (3), Table 2.

For household 1, the average ACT score, percent nonwhite population, police calls, and library usage are those of tract 2. Households 2 and 3 were constructed similarly with usage data from census tracts 20 and 29.[2] Capitalization percents for each variable were found by multiplying the values of these variables by their respective capitalization rate coefficients (as estimated in the city-wide capitalization regression, shown in Table 1). The net capitalization of taxes and benefits together is the sum shown on line (8), Table 2. The calculation of the figure is shown at the end of Table 2.

Table 1. Impact of Property Taxes, Local Government Services, and Neighborhood Traits on Housing Values

Dependent Variable: Natural Logarithm of House Price

Independent Variables	Coefficient Estimates
Net Property Tax Rate	− .0303
High School ACT	.0164
Percent Nonwhite in Census Tract	− .0040
Police Calls (serves as a proxy for crime rate)	− .0001
Library Usage	.0013

Each coefficient indicates the percentage change in the value of a house brought about by a one unit change in the independent variable. For example, if the net property tax rate increased from $14 to $15 per $100 of value, the value of the house would decrease by .3 03 percent

The estimates are all statistically significant at the 5 percent significance level and the full regression explains over 75 percent of the variation in the house values in the sample.

Table 2. Examples of Net Capitalization Results

	Low	Middle	High
(1) Income	$13,984	$23,928	$36,773
Effective Tax Rate	15.60	14.60	16.50
less: Shift Rate	.043	.143	.304
(2) equals: TAXNET (Net Effective Tax Rate)	14.93	12.51	11.48
(3) TAXNET Capitalization	− 36.4%	− 31.5%	− 29.4%
(4) ACT of High School	16.5	19.1	20.8
(5) Percent Nonwhite in Census Tract	35.2	10.0	2.1
(6) Police Calls (serves as a proxy for crime rate)	656.0	691.0	695.0
(7) Library Use	3.8	25.4	85.0
(8) Net Tax/Benefits Capitalization ((3) + (8))	− 32.3%	− 13.8%	+ 1.9%

The following example indicates how the net tax/benefit capitalization effect (line 8) is calculated for low income households (column 1).

Net Tax Capitalization
$$\ln(\text{Price}) = 14.93 \cdot (- .0303) = - .452379$$

$$1 - e^{- .452379} = 1 - .636 = .364$$

Net Tax/Benefits Capitalization
$$\ln(\text{Price}) = 14.93 \cdot (-.0303) + 16.5 \cdot .0164$$
$$+ 35.2 \cdot (-.0040) + 656.0 \cdot (-.001)$$
$$+ 3.8 \cdot .0013$$
$$= - .390$$

$$1 - e^{- .390} = 1 - .667 = .323$$

This number indicates that an increase in the property tax rate by $1 per $1,000 of market value reduces the value of the house by 3.23 percent of the house value, all else equal. For example, a $35,000 house would be expected to decline in value by about $1,000.

The results show dramatically different capitalization effects of the local fiscal system. All effects (other than specific characteristics of the house itself), taken together, cause the value of household 1's house to be reduced by 32.3 percent. Household 2 has higher income, shifts more of the tax and has better neighborhood amenities. It loses only 13.8 percent of the value of its home. Household number 3 actually gains house value because potential home buyers in its neighborhood can shift a large portion of property taxes, and because neighborhood amenities are beneficial. In fact, the results for high income households may be even better in some cases where shift rates reach the 50 percent marginal federal income tax rate.

Conclusions

In the world of Tiebout economic theory, each municipality is homogeneous, and differences in tax/benefit bundles are capitalized away. This study addressed the assumption of intrajurisdictional homogeneity and finds, at least for the city examined, that significant disparities exist. Households do indeed move to locations in an attempt to maximize their net tax/benefit interests. However, the consequences do not equalize but rather exacerbate neighborhood differences.

Differences in net tax/benefit capitalization rates are rooted in socioeconomic differences and concentrated into neighborhood disparities by housing segregation. High income households (and, therefore, neighborhoods) enjoy a lower effective tax rate and a smaller negative capitalization dollar-for-dollar of levy because of the federal tax deduction. Similarly, good schools and low crime rates raise housing prices in their neighborhoods. In low income neighborhoods the opposite occurs.

As suggested in previous studies, there are impediments to mobility and socioeconomic desegregation. Zoning barriers exist to prevent housing that is low enough in cost to accommodate low income households. Racial discrimination and overlapping taxing jurisdictions such as park districts and airport authorities preclude an escape from burdensome fiscal disparities anywhere in the larger area, reducing incentives for the poor to move. Technically, one might expect that high income families would move to low income neighborhoods, bring their lower effective tax rate with them, and pick up housing bargains. However, even if suitable housing stock were available, the negative capitalization effects of the disamenities would outweigh the gain. We do, nevertheless, see some reverse mobility when neighborhoods have deteriorated in the extreme. Housing bargains due to capitalization result in gentrification.

An obvious remedy to the differential capitalization rates by socioeconomic class is a reduction in the property tax itself and the substitution of other revenue sources.[3] One possibility is the imposition of user fees for publicly provided services that are not pure public goods. Low income households who do not choose to use the service need not pay for it. The property tax

relief would be capitalized into all housing prices, and the cost for higher income households would be shifted to a direct consumption expenditure. Each dollar of property tax reduction would be more beneficial to lower income households since they enjoy lower tax shifting rates.

An estimate of the total impact on housing prices of the combined effects of property taxes and all publicly provided services, both superior and inferior, requires a study more exhaustive than this one. The results here are merely suggestive and indicative. The further influence on housing prices of private and not-for-profit institutions (for example, shops, noxious drive-ins, churches, YMCA) might also be revealed by this type of study and would offer practical uses for such purposes as zoning decisions.

Notes

[1] Since the tax levy on all houses in the city is identical, the effective tax rate for the three households would be the same if assessed valuations perfectly mirrored sale prices.
[2] These three tracts were used as representative of low-, middle-, and high-income groups in a previous study by the authors (1986).
[3] Of course, the elimination of the property tax deduction from federal income taxes would serve a similar purpose.

Illinois Business Indexes

Recessionary pressures have eased. As Chart 1 illustrates, the current indicator rose above the trend indicator in both December 1987 and January 1988. As a rule of thumb, the movement of the current indicator above the trend indicator for four consecutive months presages a period of future economic growth.

The current upswing has been fueled by a continuing expansion of Illinois nonagricultural employment (Chart 2) and an increase in the state's personal income tax receipts (Chart 3). Though residential housing permits have experienced a general downward drift since December 1986, the 66 percent increase in December 1987 was a major factor in the rise of the current indicator (Chart 4). Residential housing permits fell in January 1988, and the Illinois building industry

indexes remain below their January 1987 levels (table of Illinois Business Indexes).

Inflationary pressures also decreased. Since October 1987, the percent change in the north central Consumer Price Index (CPI) has fallen (Chart 5). This decline was present in both the Chicago and the St. Louis CPI indexes. In January, the St. Louis index change was greater than the Chicago change, thereby reversing an earlier trend where the St Louis inflation rate was below the Chicago rate (Chart 6).

As of January 1988, the United States Department of Commerce revised the base year for the Consumer Price Indexes to 1982–84, and we have adjusted the relevant series in the table of Illinois Business Indexes accordingly.

ILLINOIS BUSINESS INDEXES

	Percent Change Jan 1987 Jan 1988	Jan 1988	Dec 1987	Nov 1987	Oct 1987	Jan 1987	Dec 1986
Leading Indicator (Current Indicator)	− 0.74[a]	13.90	11.73	9.63	9.69	14.64	11.10
Leading Indicator (Trend Indicator)	0.45[a]	11 67	10.83	10.35	9.85	11.22	9.16
Employment-manufacturing (in thousands)[b]	1.71%	938.1	936.8	934.6	934.1	922.3	922.2
Average weekly hours-manufacturing[b]	1.69%	42.0	42.4	41.9	41.5	41.3	41.6
Weekly earnings-manufacturing[b]	7.94%	$480.10	$481.60	$452.94	$448.62	$444.80	$446.37
Help wanted advertising-Chicago (1969 = 100)[c]	18.37%	116	108	115	115	98	121
Help wanted advertising-St. Louis (1969 = 100)[c]	4.48%	70	68	71	68	67	62
Retail sales (in millions)[d]	0.74%	$4,928	$7,411	$5,977	$5,965	$4,892	$7,209
Coal production (in thousands of tons)	− 6.29%	4,836	5,083	4,201	5,750	5,229	4,882
Petroleum products (in thousands of barrels)[b]	2.50%	2,050	2,100	1,810	2,000	2,000	2,110
Vendor performance[e]	23.64%	68%	71%	66%	70%	55%	56%
Building permits (in thousands)							
Residential housing units	− 37.32%	1.416	2.513	2.273	3.008	2.259	2.971
Value of residential housing	− 26.46%	$119,906	$205,704	$276,488	$336,511	$163,055	$205,774
Value of nonresidential construction							
Industrial buildings	− 41.33%	$7,496	$27,143	$40,119	$33,111	$12,776	$103,043
Office, banks, and professional buildings	− 72.22%	$17,165	$26,725	$35,788	$80,276	$61,793	$24,216
Stores and other mercantile buildings	− 46.74%	$13,003	$26,366	$44,238	$47,094	$24,415	$20,906
Other	− 35.60%	$1,968	$2,059	$5,505	$8,077	$3,056	$2,865
Consumer price index (1982–84 = 100)							
North Central US	3.50%	113.4	113.3	113.5	113.5	109.6	108.8
North Central/population more than 1,200,000	3.40%	114.1	113.9	114.4	114.2	110.3	109.6
North Central/population 360,000 to 1,200,000	3.40%	113.3	113.0	113.0	113.0	109.6	109.0
North Central/population 50,000 to 360,000	3.80%	113.4	113.6	113.9	113.9	109.2	108.0
North Central/population less than 50,000	2.80%	110.6	110.9	110.5	110.5	107.6	107.0
Chicago	3.00%	115.3	115.7	115.7	115.1	111.9	110.8
St. Louis	3.10%	113.4	—	113.1	—	110.0	—
		1987:III	1987:II	1987:1	1986:IV	1986:III	1986:II
Personal income (in millions)[b,f,g]	5.98%	$189,809	$187,750	$187,233	$180,304	$179,096	$179,622
Per capita personal income[b,f,g]	5.68%	$16,357	$16,191	$16,157	$15,571	$15,477	$15,534

[a]Represents absolute change (percent change not relevant). [b]Recent month is preliminary figure [c]The Conference Board, *Help Wanted Advertising*, January 1988 [d]Latest month projected by BEBR [e]Percentage of companies receiving slower deliveries [f]Seasonally adjusted at annual rates [g]Percent change between 1986.3 and 1987.3

Chart 1. Composite Leading Indicators (average percent change in base indexes)
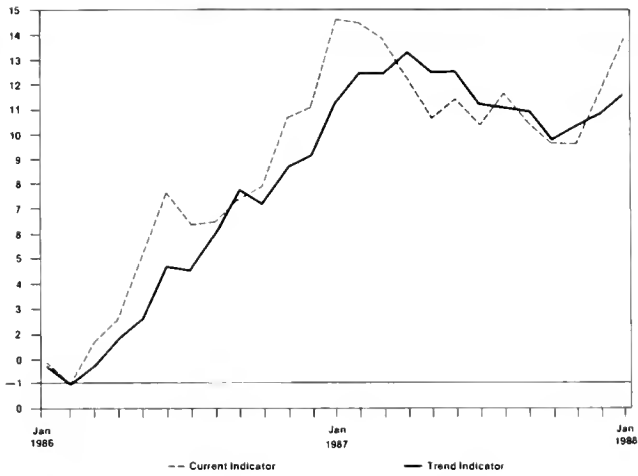

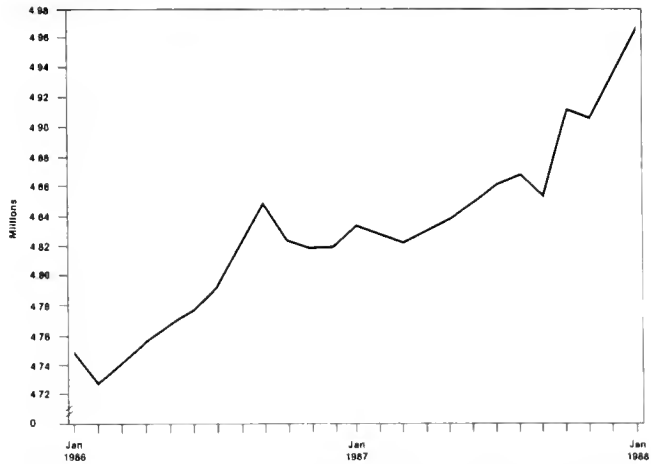**Chart 2. Illinois Nonagricultural Employment (seasonally adjusted)**

Chart 3. Illinois State Personal Income Tax Receipts (seasonally adjusted)
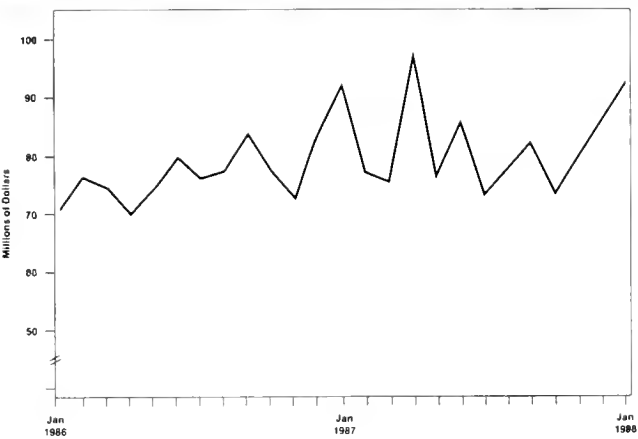

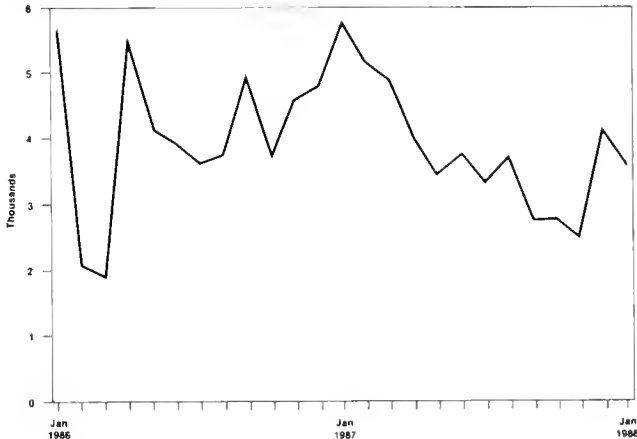**Chart 4. Illinois Residential Housing Units (seasonally adjusted)**

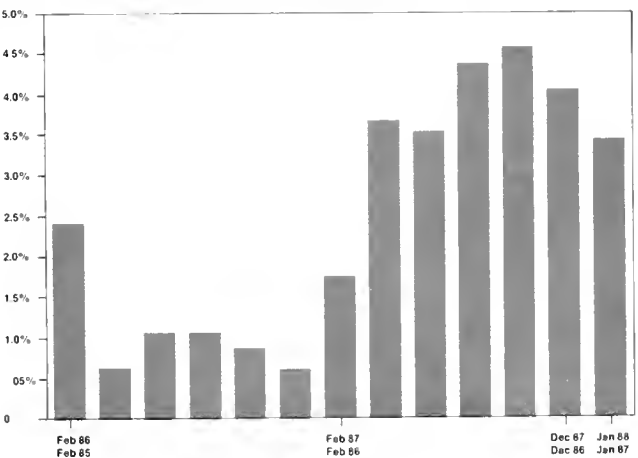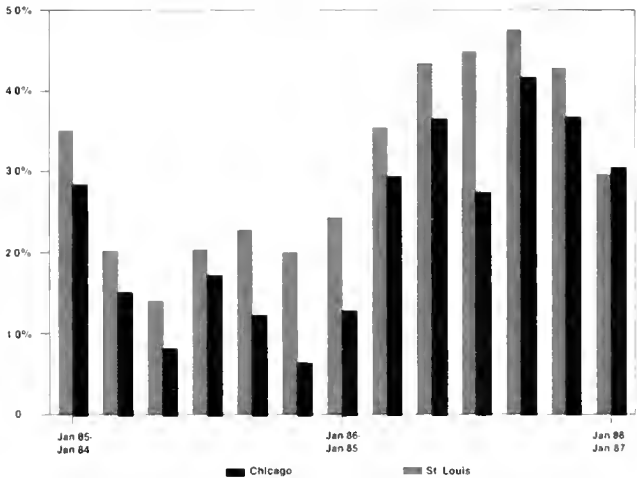**Chart 5. Year-to-Year Change in North Central CPI-U Index**

Chart 6. Year-to-Year Change in Chicago and St. Louis CPI-U


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Illinois Business Review

Illinois Economic Outlook

The Illinois Econometric Model forecasts growth in average hourly wages during 1988 similar to the increases that occurred in 1987. During 1988, hourly compensation is expected to increase by 2.1 percent in mining, 1.5 percent in construction, 1.3 percent in durable manufacturing, and 1.2 percent in nondurable manufacturing. Actual changes in 1987 were 1.4 percent, 1.8 percent, 1.8 percent, and 2.8 percent, respectively. As the table indicates, wage increases can be expected over the forecast period in both durable and nondurable manufacturing sectors. The chart shows quarterly percentage changes in wages for 1987 and the expected changes forecast for 1988. Wage increases in the last three quarters of 1988 are expected to dominate the slow growth in the first quarter resulting in continued growth in hourly compensation for the economy as a whole.

Illinois Hourly Wages (percentage change from previous quarter)

Mining ■ Construction Durables ■ Nondurables ■
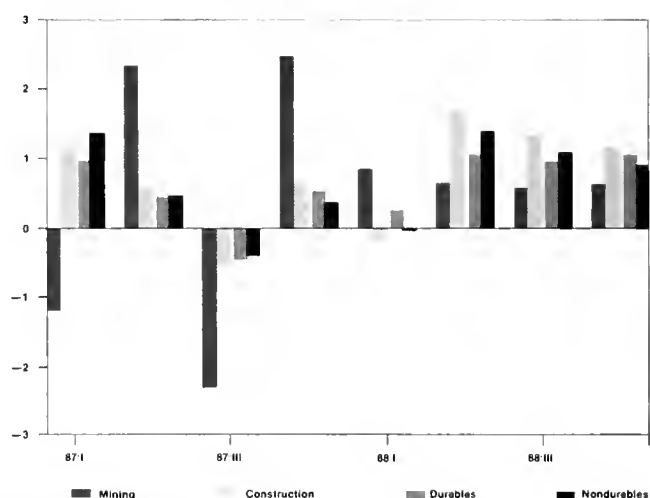
Illinois Seasonally Adjusted Hourly Wages

	History				Forecast			
	87.I	87.II	87.III	87.IV	88.I	88.II	88.III	88.IV
Mining	$14.87	$15.22	$14.87	$15.24	$15.37	$15.47	$15.56	$15.66
Construction	17.42	17.52	17.42	17.53	17.50	17.80	18.04	18.25
Manufacturing	10.82	10.87	10.83	10.88	10.89	11.03	11.15	11.26
Durable manufacturing	11.07	11.12	11.07	11.13	11.16	11.28	11.39	11.51
Primary metals	12.69	12.82	12.69	12.82	12.90	13.08	13.22	13.35
Fabricated metals	11.04	11.06	11.04	11.08	11.02	11.02	11.06	11.12
Nonelectrical machinery	12.07	12.21	12.07	12.22	12.33	12.49	12.61	12.72
Electrical machinery	9.41	9.42	9.42	9.43	9.42	9.48	9.53	9.59
Miscellaneous durables	10.95	10.93	10.95	10.93	10.93	10.95	11.00	11.06
Nondurable manufacturing	10.43	10.48	10.44	10.48	10.48	10.63	10.75	10.85
Food products	10.51	10.46	10.52	10.46	10.44	10.51	10.58	10.65
Printing and publishing	11.40	11.50	11.41	11.51	11.57	11.71	11.82	11.94
Chemicals	11.60	11.71	11.60	11.71	11.73	11.76	11.75	11.76
Miscellaneous nondurables	9.12	9.13	9.12	9.14	9.16	9.26	9.32	9.40

Bureau of Economic and Business Research

Illinois
Business

Review

HARVEY J. MILLER AND RANDALL W. JACKSON

The Impact of the Professional Football Strike on the Chicagoland Area

The recent flurry of activity stimulated by the move of the St. Louis Football Cardinals emphasizes the basic role of a professional sports franchise in regional industry. Judging from the various administrators and power brokers from various regions that actively court these franchises, this view is widely accepted. In addition to their value as civic icons, professional sports represent a major industry, and the cities that are fortunate enough to possess one of its few points of production can expect to enjoy significant economic benefits.

Like any other industry, a professional sports franchise will develop production linkages with other entities in the regional system. Each franchise requires inputs for which it must pay, thus injecting money into the regional economy. Similarly, its output will have a beneficial effect on other activities that provide complementary goods and services.

Also like any other industry, disturbances can and do occur in professional sports. Professional football recently experienced a labor strike, resulting in a distinct fluctuation in professional sports output. The strike provides an opportunity to examine the regional economic impact of these franchises. The objective of this article is to assess the impact of the recent pro-football strike on the Chicago area in particular and, more generally, on regional economies. Chicago was chosen for a number of reasons, not the least of which was access to a regional input-output model for the area.

In the next section, the particular situation of Chicago and the football strike will be discussed briefly, followed by a description of the input data estimation procedure. An explanation of the particular application of the input-output framework used in this analysis is followed by a final section presenting the impact-assessment results.

Chicago and the 1987 Football Strike

The Chicago Bears play home games in central Chicago's Soldier Field, which seats 66,030; and because each home game the Bears play is "sold out," this patronage figure is the normal production level from which football strike deviations can be measured. The 1987 strike lasted 24 days, from 22 September through 15 October, and affected games from 27 September through 19 October. The games of 27 and 28 September were cancelled outright, while the games of 4 through 19 October were conducted with nonleague member "replacement players." Attendance for these games was substantially down from normal.

The Chicagoland area itself was spared much of the brunt of the strike, because the Bears were scheduled to play away from Soldier Field for the first two weekends of the strike, when games were cancelled and attendance was at its lowest. The Bears did play at Soldier Field the second two weekends of the strike, and attendance was indeed markedly off the usual level (Table 1). Although the impact of the strike was not as severe in Chicago as in areas with a less fortunate game schedule, it was still substantial.

Table 1. Soldier Field Attendance, 27 September to 18 October

Date	Game	Expected Attendance	Actual Attendance	Difference
9/27	(away)	0	0	—
10/4	(away)	0	0	—
10/11	Minnesota	66,030	32,113	–33,917
10/18	New Orleans	66,030	46,813	–19,217
			Total Lost Patronage	–53,134

Source: Chicago Bears Ticket Office.

Data Estimation

To quantify the economic impact of the football strike, money flows both inside and outside the sports facility must be considered. Inside Soldier Field, money flows are generated through ticket sales and concessions. Outside the facility, patrons also purchase other goods and services, as well as transportation to and from the game. Less obvious, but also significant, is the fact that professional football players are paid large salaries that generate substantial consumption-related effects. Data estimation procedures are discussed later.

In-Facility Expenditures

Actual attendance figures for game days were provided by the Chicago Bears office, and these were subtracted from the usual attendance level to determine the number of patrons lost during the strike. The Chicago Bears ticket office provided the number of seats sold at each price level, so that a weighted average ticket price could be determined. Assuming constant proportions of patrons at each ticket price, the lost ticket expenditures were found by multiplying the weighted average ticket price by the number of lost patrons:

11 October: $33,917 \times 18.05 = 612,201.85$
18 October: $19,217 \times 18.05 = 346,866.85$

Data on lost concession expenditures were not available from the Bear's front office or from the licensed vendor for Soldier Field, apparently for competitive reasons. Suitably disaggregated estimates were drawn from a detailed survey taken of Atlanta Falcon patrons in 1972 (which also served as a basis for several of the out-of-facility expenditure estimates).

Estimated annual concession revenues and patronage provided a source for per-person expenditures. This figure was updated using the 1987 to 1972 Consumer Price Index ratio. To adjust for spatial variations in expenditures, median family income for both the Chicago PMSA and Atlanta MSA as reported in the 1980 census were similarly proportioned and adjusted. The modified annual per person concession revenue multiplied by the number of patrons lost in the Chicago strike, to yield a total concession revenue loss in Soldier Field:

11 October: $33,917 \times 3.16 = 107,177.72$
18 October: $19,217 \times 3.16 = 60,725.72$
Total $= 167,903.44.$

Expenditures

Nonplayer salary expenditures lost outside of Soldier Field due to the strike are of two types: incidental expenditures and transportation expenditures. The Atlanta survey provided data on out-of-facility (but within the urban area) expenditures on three broad categories: food/entertainment, lodging, and shopping. The spatial and temporal updating procedure generated lost expenditure levels shown in Table 2. Recall that per-patron expenditures are *average*; patrons from distant locations would actually spend quite a bit more, while local patrons would tend to spend little if anything on lodging or shopping.

Table 2. Out-of-Facility Patron Expenditures

	Per Capita	Lost Patronage 11 & 18 Oct.	Lost Expenditures
Food/Entertainment	$12.60	53,134	$669,488.40
Lodging	5.00	53,134	265,670.00
Shopping	1.85	53,134	98,297.90

The impact on public transit and parking was derived from available Chicago-specific data. Other expenditures, such as gasoline or tolls, could not be estimated with sufficient confidence. The impact on public transit was based on a 1985 Market Facts Survey for Chicago's Wrigley Field, which found that 34.7 percent of all patrons at Wrigley Field use public transit to arrive at the game. Using this same proportion for Soldier Field, ($53,134 \times .347$) 18,438 fewer public transit patrons spending an average of $1.40 (based on the Sunday "SuperTransfer" fare) yields a public transit revenue loss of $25,813.20.

Strike-related parking revenue estimates were based primarily on the number of parking spaces in lots normally used by Soldier Field patrons. The rates per space on game-days were known for some of the lots, but not for others. Thus, the weighted average rate for the known group was used as an estimate for the unknown group. This resulted in a potential aggregate level of revenues from these lots of $81,885 per game-day. For two game-days the total is $163,770.

However, since the Chicago Department of Planning report noted an oversupply of 6.02 percent of parking spaces on game-days, the two-day figure was reduced to $153,911.05. Lastly, since patronage at Soldier Field was down on 11 and 18 October by only 40.24 percent (in the aggregate), the final estimated loss of parking revenues due to the strike is $61,933.81.

Player Salaries

The final economic impact of the strike is the loss of football player salaries. The average football player is paid $230,000 annually, and there are 45 players on a team. Hence, aggregate consumption expenditures of these players is a significant component of economic impact. Although their weekly salaries for four weeks were forfeited, the National Football League did pay the replacement players for their services, albeit at a much lower rate. The replacement players were paid for a full four weeks, which partially offsets the regular player salaries. With the average regular football player paid $15,000 per week, and the average replacement player paid $4,250 per week, the loss in salaries due to the strike can be computed as:

$(15,000–4,250) \times 4\,\text{weeks} \times 45\,\text{players} = \$1,935,500.$

This aggregate loss in salaries does not entirely feed into the regional economy as consumption: adjustments must be made for taxes and other nonconsumption expenditures. With regard to income tax (the largest and most easily quantified drain on salaries), a typical married taxpayer with the salary of the average professional football player pays an estimated tax bill of $78,489, or 34.13 percent of the gross salary. Deflating the lost salaries by this proportion, yields a total disposable income effect of $1,274,633.

According to the Bureau of Labor Statistics consumer expenditure survey data, the top quintile of consumers spend 39.83 percent of their after-tax income on relevant consumer items. This proportion factors out expenditures for items such as housing, which would not be affected by a temporary loss of income, as well as expenditures for insurance, pensions, and other personal taxes. This final adjustment provides the estimated loss in players' income expenditures of:

$\$1,274,663.84 \times .398314 = \$507,704.50$

Methodology

The estimated direct impact does not provide a complete and accurate portrayal of the total economic impact of the 1987 football strike on the Chicago regional economy. Most notably, the data estimated represent only the initial impact of the strike and ignore the fact that money injected into a regional economy will "multiply" as it changes hands over and over again. In addition, the estimated data do not specify whether the particular initial impact stays within the region or is muted by "leaking" out of the region through a given sector's use of imported inputs. A more accurate depiction of the economic effects of the 1987 football strike on the Chicago regional economy was achieved by using the estimated direct impact as input to a single region input-output model; more specifically, the Multi-Scale Regional Input-Output Model housed at and operated by the Center for Governmental Studies at Northern Illinois University.

The study region for this analysis is the Chicago Bureau of Economic Analysis (BEA) region, a 23-county region centered on the Chicago metropolitan area that encompasses the northeastern quadrant of the state of Illinois and some contiguous counties in Wisconsin and Indiana. This definition of the Chicagoland area was chosen to provide the maximum degree of closure for the input-output model, which is best applied in relatively closed regions. In addition, since professional football franchises are relatively dispersed across the country, the "hinterland" of a particular franchise is more likely to be regional in scope than urban or even metropolitan, despite the city-specific team label.

Table 3 provides a summary of the direct impact data. In-facility expenditures were captured using a final demand translator specific to the operation of commercial sports facilities. This translator distributes the disturbances across a pattern of industrial sectors that are known to be structurally linked to commercial sports facilities and apportions demand changes to regional and external sources using regional purchase coefficients for each industry sector. In contrast, the out-of-facility expenditures and salaries are fed into the model as direct output changes, since they are known to occur within the region. Also note that only 54 percent of the parking expenditures are used as input to the model, because as an industry, parking per se does not have as well-defined a structure of inputs and outputs as other industries. Land and labor and built capital are the only real input, and it was assumed that parking revenues would feed directly into household income adjusted for relevant consumption using the Bureau of Labor Statistics consumer expenditure data in a manner similar to the adjustment of player's salaries. However, in this case the income was treated as before-tax income and was adjusted using the average expenditure patterns of all consumers.

Table 3. Input Data Summary

In-Facility Expenditures	
Tickets	$ 959,068.70
Concessions	167,903.44
Total	$1,126,972.14
Out-of-Facility Expenditures	
Food/Entertainment	$669,488.40
Lodging	265,670.00
Shopping	98,297.90
Parking	33,411.18
($61,933.81 × .539466)	
Public Transit	25,813.20
Player's Salaries	
(after tax and consumption)	$507,704.50

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The strike effects are short. The input-output framework, however, is better suited to longer term effects or permanent changes. Thus, some of the wage and employment sectors estimated by the model may be overstated, since one would not expect salaried or contracted workers to lose income or employment after only a four-week downturn. This will also effect the model's estimated total impact, which includes direct, indirect, and income-induced effects. In contrast, certain wage and employment effects are not overstated, since many affected workers do rely upon commissions directly related to the sporting event. Hence, it is suggested that the total impact estimated is only slightly higher than a medium-strength effect.

Results

From an initial impact estimate of $2,727,400, $2,337,100 were estimated by the model to be region specific. Therefore, $390,300 of the initial loss due to the strike occurred outside the defined region. This leakage was accounted for by the in-facility expenditures, only 65.37 percent of which remained within the region.

A summary of these effects is presented in Table 4. The (direct, indirect, and induced) impact of the strike on the Chicago regional economy was over $2.9 million in output and more than $1 million in wages. The regional economy suffered a corresponding loss in value added of nearly $1.7 million with value added defined as employee compensation, profit, interest, capital consumption allowance, and indirect business taxes.

Table 4. Total Effect of the 1987 Football Strike on Chicago BEA *($ millions)*

	Output	Wages	Value Added
Agriculture	0.009	0.002	0.004
Agriculture Service, Forestry, and Fish	0.009	0.004	0.004
Mining	0.002	0.000	0.001
Construction	0.063	0.041	0.049
Manufacturing	0.171	0.027	0.050
Transportation and Public Utilities	0.228	0.046	0.114
Wholesale	0.113	0.047	0.080
Retail Trade	0.656	0.235	0.374
Finance, Insurance, and Real Estate	0.361	0.070	0.260
Services	1.277	0.562	0.755
Government	0.023	0.006	0.011
Total	2.911	1.041	1.701
Multipliers	1.735	1.563	1.762

The input-output framework clearly captures the multiplying effect that occurs as money enters the regional economy. These system-specific multipliers for professional football in Chicago are shown as the last entries of the column in Table 4. Thus, for every $1.00 in initial output disturbance that was caused by the football strike, an additional loss of approximately $0.74 will occur. Similar relationships are represented through the wage multiplier (1.563) and the value-added multiplier (1.762).

Table 5 summarizes the industry sectors that were most affected by the strike, sorted by value added. The top three are consistent with intuitive expectations: amusement and recreation services, eating and drinking establishments, and hotels and other lodging, with amusement and recreation by far the most affected sector in terms of output. Perhaps a bit more surprising is the fourth most affected sector in terms of output: real estate. However, the central position of real property owners and operators to the rest of the football-related activities is easily demonstrated. Land, and especially land in prime locations, is an integral part of both the sports facility itself and the other activities linked to the activity in the facility. Thus, the real property agents intercept money flows in this system in the form of rent, even in the short run since commercial leases can specify a percentage of gross monthly revenues as part of the rental payment.

Table 5. Total Effect of the 1987 Football Strike on Chicago BEA *($ millions)*

Sorted by Value Added			
	Output	Wages	Value Added
Amusement and Recreation (79)	0.607	0.285	0.380
Real Estate (65)	0.212	0.014	0.170
Eating and Drinking Places (58)	0.388	0.099	0.167
Hotels and Other Lodging (70)	0.299	0.140	0.158
Health Services (80)	0.088	0.042	0.058
Apparel and Accessory Stores (56)	0.072	0.037	0.056
Wholesale-Nondurable Goods (51)	0.071	0.030	0.050
Special Trade Contractors (17)	0.063	0.041	0.049
Business Services (73)	0.091	0.025	0.044
Electric, Gas, and Sanitary Service (49)	0.117	0.013	0.043

Discussion and Conclusion

Although the Chicagoland region was spared much of the brunt of the effects of the 1987 football strike due to its game schedule, it is clear that even with this relatively minor disturbance, some substantial economic impact did occur. Despite the disturbance of only two game days and an aggregate loss of only 40 percent of the patronage on those days, a total loss to the regional economy of close to $3 million in output, and over $1 million in wages was estimated.

The substantial effect of even a moderate fluctuation in pro-football activity indicates not only the beneficial impact that these franchises normally have on a given region, but also the regional economic vulnerability to these activities. While franchise owners receive the majority of their revenues from network television contracts, much of the rest of the regional economy is less able to ride out a strike. The $1,697,477 loss in value added to the Chicago regional economy, while small in percentage terms, indicates a certain vulnerability, since these monies have the most direct human impact in employee compensation. This human impact is accentuated by the fact that the most affected sectors are among the more labor intensive activities in the economy (services, wholesaling, and retailing, for example). Hence, although these professional sports franchises can have very real benefits to a regional economy, they also can have very real human costs when interrupted or lost. This is especially relevant in light of the all too frequent departure of franchises from given localities, even after substantial public-sector investments to lure or keep the activities within their borders.

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Illinois Economic Update

The contents of the Bureau of Economic and Business Research's annual publication, the *Illinois Economic Outlook* are completed a few months before the booklet emerges from the printing process. Partly as a consequence of publication lag, but chiefly as a consequence of delays in data availability, it is frequently the case that the analyses underlying the *Outlook* are based on information remote in time for the year for which predictions are relevant. Moreover, from time-to-time there are important, but unanticipated, changes in the external environment. Such changes often make prior forecasts obsolete.

In an effort to keep our readers abreast of important changes, the *Illinois Business Review* presents this brief update of 1988 *Illinois Economic Outlook*.

State Taxes and Expenditures by J. Fred Giertz

State tax revenues have been slightly stronger than expected, yet they are insufficient to meet the many expenditure demands of the state. Indicative of the state's cash flow problems, tax refunds and various other state payments have been extremely slow (most notably Medicaid reimbursements to health care providers).

Prospects for the remainder of the year hinge on the passage of a tax increase. Without an increase, state fiscal conditions are likely to become even more austere.

Elementary and Secondary Education by James Gordon Ward

The governor's budget provided no funding increase for elementary and secondary education. This carries adverse long-term implications for the state's economic development.

Investment in Infrastructure by J. Fred Giertz

Even though the road fund balance continues to be substantial, the governor has proposed a 5-cents-per-gallon gasoline tax to be used for maintenance and new construction.

The highway congestion problem in suburban Chicago, especially DuPage County, has become an important issue of concern.

Exchange Rates by Morgan J. Lynge, Jr.

Following a peak in early 1985, the US dollar has fallen against most foreign currencies. Having approached its 1980 level by the end of 1987, the decline in the value of the dollar has slowed. Hence, the benefits flowing from the devaluation—declining relative prices of Illinois' agricultural products and Caterpillar tractors—have stopped increasing. If the price of the dollar remains stable, any further gains in foreign demand for Illinois products must reflect other factors.

Agriculture by Darrel Good

Farm income growth is more favorable than anticipated in the 1988 Outlook. The improved income picture reflects higher prices and improved demand for soybeans along with strengthened livestock prices.

Export demand for soybeans and soybean oil has been stronger than anticipated. The increased demand has emerged from unanticipated Soviet purchases of soybeans, ongoing weather problems in India (which have reduced oilseed production), and late season dry weather in Brazil (which has reduced the size of the 1988 soybean harvest). Increased exports have resulted in a more rapid reduction in the US soybean surplus than expected. As a consequence, average prices over the next 18 months will probably be at the highest levels in four years.

Because of a low rate of expansion in US pork production, livestock prices are likely to continue to be higher than previously anticipated

Employment by Gregory A. Gilbert

Since the publication of the 1988 Outlook, employment growth statistics for 1987 have been released. Illinois employment rose 1.4 percent last year, compared with an increase of 2.6 percent in the nation as a whole. Even so, the state unemployment rate declined to 7.4 percent, a 0.75 percent decline. The US unemployment rate drifted to 6.2 percent in 1987, only 0.12 percent lower than during the preceding year.

Commercial Banking by Morgan J. Lynge, Jr.

Illinois remains an attractive market for out-of-state bank holding companies, and the acquisition of Illinois banks continues. Most of the acquired banks are located in the suburbs of Chicago. Such acquisitions provide out-of-state banks with important footholds in lucrative consumer and middle-sized business markets.

Illinois' two largest banks, along with most large US banks, reported huge losses for 1987 as they wrote down the value of their loans to borrowers in less developed countries. Both Illinois banks appear to be posed for improved profitability in 1988.

Chicago Financial Markets by Joseph E. Finnerty

The October 1987 stock market crash raised important questions relating to the role of the financial futures and options markets. The chief question in the continuing debate is whether these markets contributed to the severity of the decline. If, at length, the trading and use of futures and options is restricted by regulation, the Chicago markets will receive a damaging blow, for such regulation may drive the markets offshore beyond government control.

Outlook by Marvin Frankel

In the 1988 Outlook we took note of the October 1987 precipitate stock market slide, with its potential for adverse economic impact. Our concern was that the substantial decline in a major category of financial assets could cause restraint in consumer and business spending, leading in turn to below-forecast performances in both the nation and the state. In the months following the slide, most business economists cut their forecasts for growth in 1988 significantly, and some anticipated a recession as early as the second quarter of this year.

Fortunately the logic of forecasts is not always, if often, the logic of the economy. As events have had it, both the national and state economies have held up quite well, with output, employment, consumption, and investment all continuing to expand. Economists have been revising their forecasts toward their original levels. The predominant current concern for the near term is for tightening product markets and accelerated price increases. An examination of the economic record for the past six months does not reveal even a hint of the major disturbance in financial markets that took place in 1987.

As of this writing, the outlook for the Illinois economy remains reasonably satisfactory. For 1988, as compared with 1987, the Illinois econometric model indicates that employment will be up 2 percent, nominal personal income 6.4 percent, and manufacturing value added 4.5 percent. Income generation in both retail trade and in services should also rise by 7 percent and 9 percent, respectively. However, much of the gain in these categories will be realized in the first half of the year. Thus, it is expected that employment will be flat in the July-December period and that manufacturing value added will rise only about 1 percent.

RICHARD KOLHAUSER

The Growth in State Taxes: A Review of the 1971–1987 Period

One of the most important characteristics of a state's tax structure relates to how much new revenue is generated each year. One way state tax revenue can increase is as a consequence of legislative action. For example, revenues will rise if the legislature increases tax rates or approves a new tax. But tax revenues also increase routinely without legislative action. In this latter case, the increase in revenue is generally referred to as the "natural growth" or "automatic increase."

Natural growth occurs because state tax revenues tend to expand along with growth in the economy. In Illinois, from 1971 to 1987, state tax receipts deposited into the state's general funds increased from $2.6 billion to $8.6 billion, with most of the $6 billion increase resulting from natural growth.

In general, the broader the tax base the more revenues tend to reflect general economic growth. Accordingly, broadly based taxes generally constitute a reliable source of revenue growth. For example, the Illinois income and sales taxes are broadly based, tending to grow along with the state economy. In contrast, the cigarette and liquor taxes do not conform closely to shifts in the Illinois economy.

The natural growth in revenues plays a vital role in public finance. It has been common to expect that the natural growth in state revenues will finance routine increases in the cost of state programs due to such causes as inflation and the growth in service levels (caseloads). If the tax structure is quite responsive to economic growth, the natural growth in revenues might also be enough to finance limited expansions in state programs. However, the legislature must generally enact a tax increase to finance a major new program or to expand existing programs significantly.

There is no optimum rate at which taxes should increase, but problems develop if revenue growth is out of balance with economic growth. If taxes grow faster than the state economy, the state tax burden begins to climb, taxpayers may start to complain, and businesses may threaten to relocate. On the other hand, if the rate of natural increase in revenues lags behind the rate of economic growth, the level and quality of state services may decline, programs may be cut, and/or frequent tax increases may be needed. For these reasons, a stable system of public finance is generally thought to depend upon a tax structure that yields increases in revenues at roughly the same rate as the growth in the state economy.

The purpose of this article is to review the growth in state tax revenues from fiscal year 1971, the first full year of the state income tax, to 1987, the last completed fiscal year. State fiscal years begin in July and end the following June. For example, state fiscal year 1988 began July 1987 and finishes June 1988 (unless otherwise noted, dates refer to state fiscal years). The analysis relates the growth in state revenues to the growth in the Illinois economy. It identifies and describes some of the economic, demographic, and legislative influences that helped determine revenue performance in the 1970s and the 1980s.

General Fund Revenues and Tax Sources

The analysis centers upon the state's general revenue funds (GRF). Revenue growth from the fund is of interest because the state's two largest tax sources, the income and sales taxes, are deposited chiefly into it. Furthermore, the general revenue fund supports many of the largest and most prominent state programs, including elementary and secondary education, higher education, community colleges, the state prison system, care for neglected children, help for the elderly, care for the mentally ill, and enforcement of public health standards.

In 1987, total GRF revenues were just over $11 billion. Of this amount, state taxes yielded about $8.6 billion, 78 percent of the total revenues. Other GRF receipts consisted of federal reimbursements for public aid spending, $1.6 billion (13 percent); the lottery, $553 million (5 percent); and miscellaneous sources, $300 million (3 percent).

The $8.6 billion yield from GRF taxes was derived from the sources shown in Table 1. The income tax, sales tax, and public utility taxes produced about 91 percent. Over the years, most of the natural increases in GRF taxes have derived from these three sources. Other taxes contribute only marginally to the annual increase in revenues. For most of the 1980s, however, the state lottery has significantly enhanced the growth in GRF receipts. For this reason, the analysis of GRF revenue growth frequently includes the lottery even though it is not really a state tax.

Table 1. General Funds Tax Sources—FY87 ($ billions)

	Yield	Percent of Total	Cumulative Percent
Income Tax	$4.0	47	47
Sales Tax	3.2	37	84
Public Utility Tax	0.6	7	91
Cigarette Tax	0.2	2	92
Liquor Tax	0.1	1	93
All Other	0.6	6	100
Total Taxes	$8.6		

Tax Growth 1971–1987

In the last 16 years, the yield of GRF taxes increased $6 billion, from $2.6 billion in 1971 to $8.6 billion in 1987. During this period, there were only a few legislatively approved tax increases. It can be argued that one significant exception is the increase in the state sales tax rate from 4 percent to 5 percent in 1984. This action generated substantial new GRF revenues. Even so, the revenues gained from this rate increase served to offset revenues lost to preceding tax relief. In fact, considering the 1971–1987 period as a whole, the cumulative revenues lost through tax relief are not materially different from the new revenues generated through legislatively approved tax increases.

The state income tax rate was also increased in 1984, but the rate increase was temporary. An initial gain in revenues prompted by the higher rate was offset after the rate expired. Therefore, cumulative revenue growth over the 1971–1987 period was not affected. Other tax increases enacted during the period were of comparatively minor magnitudes and did not significantly affect revenue growth. For these reasons, the $6 billion increase in the GRF tax yield from 1971–1987 can be viewed as resulting primarily from "natural growth."

In percentage terms, the increase in GRF annual tax revenues from 1971 to 1987 was 230 percent without the lottery and 252 percent with the lottery included. Over this period, the average annual rate of increase for GRF revenues was 7.8 percent (8.2 percent including the lottery).

How do these increases compare to the growth in the Illinois economy for the same period? The change in the annual flow of Illinois personal income is a useful and common method to measure growth in the state's economy. The growth in Illinois personal income is shown in Table 2.

Table 2. The Growth in General Fund Revenues

	Percent Change from 1971–1987	Average Annual Percent Change
Taxes	230	7.8
Taxes and Lottery	252	8.2
Inflation (CPI)	180	6.6
Illinois Personal Income	252	8.2

There is a view that if the natural growth in state revenues does not match the rate of inflation, the state's ability to provide services will decline. For this reason, the growth in inflation is also shown in Table 2.

Since the first full year of the state income tax in 1971, the average rate of increase in GRF revenues plus the lottery has exceeded the rate of inflation and been equal to the growth in Illinois personal income. This is a very important result. It is a principle reason why Illinois has been able to maintain a reasonably stable tax structure since 1971.

For the period as a whole, the increase in GRF revenues was sufficient to finance the inflation-induced increases in state spending, provide for modest expansion in existing programs, and even to allow for the addition of a few new programs.

Revenue Growth: Two Decades Compared

It is important, however, not to read more into the 1971–1987 experience than it contains. Discussion of the period as a whole is somewhat misleading. There are, in fact, two important different trends within the overall period. One trend dominated the 1970s; the other has characterized the 1980s.

From 1971–1979 GRF revenues grew more rapidly than both inflation and Illinois personal income (Table 3). Revenues grew at an average rate of 10.3 percent per annum. By comparison, the rate of inflation averaged only 7 percent, and Illinois personal income 9.7 percent. As a result, for each 1 percent increase in inflation and personal income, GRF revenues increased 1.47 percent and 1.06 percent, respectively.

For the 1980s, the average increases in GRF revenues has been only about one-half the rate for the 1970s (5.3 percent versus 10.3 percent). The slower rate of increase can be partially attributed to a reduced rate of inflation. But the growth in GRF revenues was even slower than the growth in inflation and state personal income.[1]

From 1979 to 1987 GRF revenues increased an average of 5.3 percent per year compared to an inflation rate of 6.3 percent and a 6.7 percent growth rate in Illinois personal income. In the 1980s, for each 1 percent increase in state income, the increase in GRF revenues has been only 0.79 percent. If personal income were to increase by 5.5 percent, revenue growth would be about $125 million less each year than would have been the case with the preceding decade's 1.06 percent factor.

For most of the 1980s revenues from the state lottery have helped to supplement the growth in GRF revenues. The lottery grew at an especially rapid pace from 1980–1986, with increases averaging nearly 61 percent ($87 million) a year. Even though the lottery was and remains but a small proportion of total GRF revenues (about 5 percent), it was a major source of new revenues during this period. In 1983, the trough of the recession, the lottery increased more than all other GRF taxes combined.

If growth in the lottery is combined with the growth in taxes, the overall increase in GRF revenues averages 6 percent a year. Such an increase is stronger than the 5.3 percent average rate of growth for taxes alone, but falls short of the 6.3 percent inflation rate and the 6.7 percent growth in state income (Table 3).

Table 3. The Growth in General Fund Revenues: Comparison of 1970s and 1980s *(% increase)*

	1971–1979 Average Annual Percent	1979–1987 Average Annual Percent
Taxes	10.3	5.3
Taxes and Lottery	10.4	6.0
Inflation	7.0	6.3
Illinois Personal Income	9.7	6.7

The reason GRF taxes grew at a slower rate than the state economy is simple in terms of arithmetic. Each of the three largest GRF revenue sources grew more slowly than state personal income. Just the opposite was true in the 1970s, when the average rate of growth for the public utility, sales, and income taxes, surpassed the growth in personal income (Table 4).

Table 4. The Growth in General Fund Revenue Sources: Two Periods Compared

	1971–1979 Average Annual Percent	1979–1987 Average Annual Percent
Public Utility	13.9	3.7
Income Taxes	11.4	6.5
Sales Tax	10.1	5.1
Inflation	7.0	6.3
Illinois Personal Income	9.7	6.7

The sharpest slowdown occurred in the public utility tax. After increasing almost 14 percent per year in the 1970s, the public utility tax has increased on average only 3.7 percent a year in the 1980s, far less than the 6.7 percent average annual rate of growth in personal income.

There are several reasons why nominal and relative growth in revenue from the public utility tax have declined. Following the first oil boycott in the mid 1970s, energy prices increased at extraordinary rates through 1981. In 1980, for example, energy prices jumped 38 percent! In response, the public utility tax collections increased, on average, over 14 percent a year from 1975 to 1981.

But the public utility tax has not contributed to GRF revenue growth since 1984. In fact, revenues from this source have declined in three of the last four years. This decline is due to at least four factors. First, the rapid growth in energy prices began to level off in 1983; by 1986 energy prices were actually declining. Secondly, following adoption of energy conservation measures by business and individuals, the consumption of natural gas has been on the wane. Natural gas sales are one of the principle components of the public utility tax.

Third, the jump in energy prices has encouraged users to contract directly with pipeline companies for natural gas, thus bypassing the local utility and the state public utility tax. Fourth, the public utility tax was changed by the legislature so that increases in energy prices do not increase the yield—the tax has been "capped." One of the three largest GRF tax sources and a principal source of revenue growth over the last two decades no longer keeps up with the economy.

Growth in the state sales tax has also fallen behind the growth in personal income. In the 1970s, for every 1 percent increase in personal income, the sales tax increased 1.04 percent; the equivalent ratio for the 1979–1987 period is only 0.76 percent. The decline in this ratio means that, on average, the annual growth in the sales tax has been reduced by about $50 million.

Like the utility tax, the sales tax also responded to the increase in energy prices in the 1970s. Gasoline constitutes about 8 percent of the total sales tax base. As gasoline prices soared in response to the oil boycott, the sales tax yield was pushed higher. The price of food, an even larger component of the sales tax base, rose almost as dramatically as energy costs at times during the 1970s. For example, the price index for food jumped nearly 18 percent in 1974. From 1971 to 1979, both food and energy prices increased faster than inflation generally, helping to push the average rate of sales tax increase ahead of the increase in personal income.

Since 1980, however, the sales tax has not kept pace with the Illinois economy. Several tax relief measures for business and individuals were enacted from 1979 through 1987.[2] The most significant of these were enacted early in the decade. The first important measure was an exemption for business equipment and machinery. This exemption was quickly followed by a sales tax exemption for food and drugs. The exemptions were enacted just as the economy slipped into a long and severe recession. The revenue losses from tax relief, combined with the loss in sales from the recession, kept revenues from the sales tax from increasing from 1980 to 1983.

In 1984 the sales tax rate was increased from 4 percent to 5 percent, in part to help fill the void left by tax relief. Because of the way the rate change was structured, there were large increases in sales tax revenue in both 1984 and 1985. In 1986 and 1987, however, growth in the sales tax revenues again became quite sluggish, increasing just 3.7 percent and 0.6 percent, respectively. Part of the explanation for the diminution in revenue growth is that inflation diminished, averaging only about 2.5 percent. Additional sales tax exemptions also contributed to slow revenue growth. Beginning in 1986 a portion of the sales tax receipts were reallocated to the Build Illinois fund.

In the 1980s, revenues from the state income tax (corporate and individual) nearly kept pace with growth in the state economy, increasing annually at an average rate of 6.5 percent, just below the 6.7 percent growth in personal income. In the 1970s, income tax revenues increased faster than personal income (Table 4).

The individual income tax has been a consistent and reliable source of revenue growth, increasing at a somewhat faster rate than the Illinois economy in both the 1970s and 1980s. The corporate tax, after performing well in the 1970s, has not been a consistent source of revenue growth in the 1980s.

The individual income tax was a strong performer during the 1970s because the economy fell into recession just once, in 1975. Throughout the remainder of the decade, there was rapid growth in both employment and income, boosted by unusually favorable demographic trends. Employment gains in the 1970s were driven, in part, by the entry of the baby boom generation into the workforce. Women also began to participate in the labor force in unprecedented numbers.

These demographic trends have moderated in recent years. The baby-boom generation no longer fuels increases in the labor force. Also, growth in the labor force participation rate for women has slowed as the rate for women has approached the rate for men. Consequently, future increases in the individual income tax revenues will depend more heavily upon increases in wage levels and less upon the growth in employment.

Another factor contributing to growth in individual income tax revenues in the 1970s was the increase in the "effective income tax rate" for individuals.[3] But this factor will contribute only marginally to accelerated growth in the 1980s.

For the state as a whole, the effective income tax rate was less than 1.9 percent in the early 1970s but has increased over the years to about 2.2 percent. The effective tax rate has increased because the value of the personal exemption has remained fixed at $1,000 and because there has been a decline in nontaxable income from the sale of capital assets purchased before the income tax was enacted.

The effective rate for the individual income tax increased quite rapidly in the early years, enhancing the annual rate of increase. Now, however, the effective rate is increasing more slowly, and the fiscal bonus each year is small.

Revisions to federal tax laws have twice had a significant effect on individual income tax yields in the 1980s. Early in the decade, Illinois tax yields were reduced when changes in federal tax laws served also to reduce the state tax liability. However, the federal tax reform act of 1986 reversed many of the earlier changes, resulting in higher Illinois tax yields. A windfall gain from federal tax reform boosted the individual income tax yield in 1987 by about $100 million.

Both the individual and corporate Illinois income tax rates were increased in 1984. The increase was required to liquidate unpaid obligations carrying over from the recession years. The higher rate was effective for only one fiscal year, and state income tax rates dropped back to the original level (enacted in 1969).

A tax deduction enacted in 1984 continues, however. The individual income tax was used as a vehicle to provide property tax relief to Illinois homeowners. But since there are few such deductions (or other exemptions and credits), the individual income tax remains the GRF's most responsive tax source. It is the GRF source most likely to grow at the same rate as the Illinois economy.

The Illinois corporate income tax has not been a strong source of new revenues in the 1980s, with increases averaging less than 2 percent a year. In the previous decade, the corporate income tax outperformed the Illinois economy. In the early 1980s, there were few increases in corporate tax revenues because of the recession. For four years there was essentially no real growth in the national economy, and the recession jarred midwestern economies even more than the nation as a whole. Since 1980 state corporate income tax revenues declined each year until the tax rate was increased temporarily in 1984. Thereafter, corporate yields have been adjusted for so many events that it is not easy to determine how well the corporate income tax is performing. Some of these events included a change in the method of corporate reporting, certain one-time gains from audits and federal tax reform, and very high refund levels. At best, growth in the corporate tax has been inconsistent in the 1980s. The legislature has also recently revised the formula apportioning corporate income to Illinois, adding still more uncertainty as to how the corporate tax will grow in the future.

While the public utility, sales, and income taxes have been the most significant sources of GRF revenue growth since 1971, other tax changes have affected revenue growth from time to time. In recent years, for example, the state inheritance tax has been eliminated, a messages tax has been enacted, and the cigarette tax rate has been increased. Such changes affect revenue growth at the time of enactment, but do not critically affect revenue growth over the long term.

Will GRF Revenue Growth Match Economic Growth in Coming Years?

This analysis has shown that the rate of GRF revenue growth has fallen behind the rate of growth in the Illinois economy in the 1980s. Estimates of the increase in state taxes for 1988 and 1989 continue below the projected rate of increase in Illinois personal income. Because tax revenues are lagging behind the Illinois economy, GRF revenue growth is reduced by about $125 million per year.

There is no solid evidence to indicate how the gap in growth rates will change in the coming years, but it seems unlikely that the current tax structure can generate natural revenue growth at a rate equaling the

growth in the Illinois economy. This issue is of particular importance because future increases in the state lottery are not likely to be quite so robust as in years past, placing the burden of maintaining state services solely upon the growth in GRF revenues.

The future performance of the three largest GRF revenue sources will largely determine whether the rate gap can be narrowed. The outlook for the public utility tax as a future source of revenue growth, is not especially good. This source, once the strongest GRF revenue performer, appears effectively constrained by legislation limiting future increases. The Illinois corporate tax is an unreliable source of revenue growth for the future, due to legislative changes and changes in federal tax laws. There is, however, at least one reason to be optimistic. The outlook for US and Illinois exports has improved in recent months. A higher level of Illinois exports, which results in higher corporate profits, could help revitalize the Illinois corporate income tax. It is also possible that federal tax reform could benefit Illinois more than is currently expected.

The individual income tax is the most reliable GRF revenue source. In the 1980s the tax revenues increased at a pace faster than the Illinois economy. There have been few reductions to the tax base, and there is every reason to believe that the individual income tax will continue to be a principle source of GRF revenue growth.

If in coming years the gap between the growth in GRF taxes and the growth in the Illinois economy is to narrow, it will probably be because the sales tax is more "responsive to the economy" than it now appears. The sales tax base without food, drugs, and business equipment is still comparatively new. Even so, the first evidence suggests that the new base is not as responsive to economic growth as it once was. If the performance of the sales tax does not show marked improvement, the gap in growth rates between GRF revenues and the Illinois economy is not likely to decline.

NOTES
[1]Transfer payments, a nontaxable component of personal income, has increased faster than personal income as a whole. However, even with the exclusion of transfer payments from personal income, the comparisons in Tables 3 and 4 remain valid.
[2]The sales tax exemptions included sales of business equipment and machinery, food and drugs, farm equipment, gasohol, graphic arts equipment, oil field equipment, coal and mining equipment, and certain materials used in enterprise zones.
[3]The effective rate is defined as tax collections/adjusted gross income. The effective tax rate is always less than the statutory tax rate of 2.5 percent. For an individual taxpayer, the effective tax rate varies with income and the number of personal exemptions claimed.

Richard Kolhauser is the deputy director of the Bureau of the Budget, State of Illinois.

Gregory A. Gilbert

Forecasting Model Updated

In a continuing effort to make available the most accurate forecasts, the Bureau of Economic and Business Research has updated the Illinois retail forecasting model. Since July 1981, BEBR has published the most recent month forecast estimate in the Business Index section of the *Illinois Business Review.* The historical Illinois retail sales series is furnished by the United States Commerce Department and is updated in each issue of the *Review.*

Advances in econometrics and statistical analysis have allowed for the development of improved forecasting procedures. Both the current and old procedures base forecasts on past trends. Forecasts based on historical data do not take into account current changes in the economy. Even so, they provide bench marks for the near-term future, assuming changes in the economy affect retail sales gradually rather than in sudden shifts.

As the chart illustrates, the estimates from the updated procedure are markedly more accurate than the old procedure. For the illustrated sample period, the new estimates are in error by an average of 1.08 percent, with a standard deviation of 3.32 percent. The old estimates had a average error of − 5.12 percent, with a standard deviation of 5.4 percent. The new estimating method continues to show relatively large errors. For example, in May 1987, the model overestimated retail sales by 12 percent. But the frequency of these relatively large errors has been reduced. There were four errors greater than 10 percent with retail sales estimated by the old method. There was only one error term of this magnitude with the new method.

Bimonthly Retail Sales Forecast

13
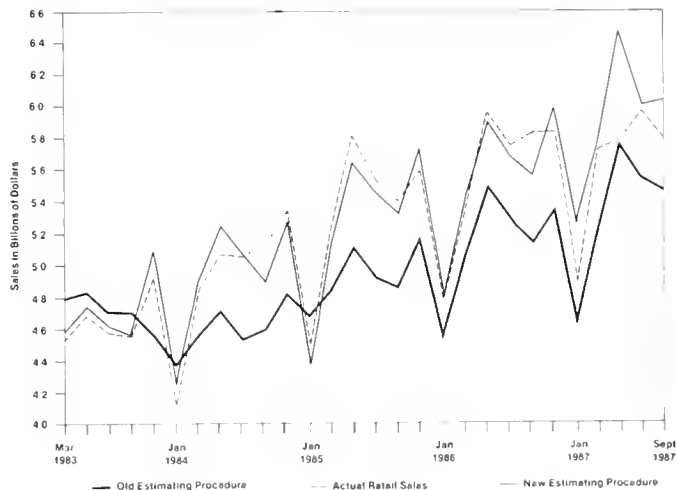
Illinois Business Indexes

The economic outlook for Illinois continues to improve. As Chart 1 illustrates, the current indicator has exceeded the trend indicator for the last four months. This movement indicates a continuation of the economic expansion.

The February and March levels of nonagricultural employment reached all time month highs. Seasonally adjusted nonagricultural employment increased steadily during the first quarter of 1988 (Chart 2). The March level of nonagricultural employment was by 2.0 percent (or 95,000 jobs) higher than a year earlier. Manufacturing employment has risen 1.5 percent reflecting an increase in 10 of the last 12 months (Chart 3). Durable employment has increased slightly more than seasonally since August of 1986 (Chart 4).

The state's unemployment rate continues to exceed the national average (Chart 5). In March, the national average dipped to its lowest level for this decade (5.6 percent). Although the Illinois rate dropped to 7.3 percent, the Illinois unemployment rate remains higher than its September 1987 low of 6.4 percent. Unemployment had increased sharply in February (from 6.7 percent to 7.5 percent). The Illinois Department of Employment Security attributes much of the February increase to the weather. February was colder than normal, resulting in layoffs in the construction, transportation, and mining industries. In addition, there were employment losses in retail trade.

Inflation in Chicago has drifted lower since August 1987. Even so, rates of price level increase over the past year are markedly greater than during the preceding year (Chart 6).

ILLINOIS BUSINESS INDEXES

	Percent Change March 1987– March 1988	March 1988	Feb 1988	Jan 1988	Dec 1987	March 1987	Feb 1987
Leading Indicator (Current Indicator)	−0.31[a]	13.57	11.48	13.90	11.73	13.88	14.45
Leading Indicator (Trend Indicator)	0.51[a]	12.99	12.24	11.67	10.83	12.48	12.46
Employment-manufacturing (in thousands)[b]	1.49%	939.7	938.0	938.1	936.8	925.9	926.5
Average weekly hours-manufacturing[b]	0.96%	41.9	41.9	42.0	42.4	41.5	41.5
Weekly earnings-manufacturing[b]	3.10%	$465.09	463.41	$480.10	$481.60	$451.11	$448.62
Help wanted advertising-Chicago (1969 = 100)[c]	2.65%	116	116	116	108	113	113
Help wanted advertising-St. Louis (1969 = 100)[c]	−1.47%	67	69	70	68	68	70
Retail sales (in millions)[d]	5.69%	$6,038	$5,264	$5,304	$7,504	$5,713	$4,952
Coal production (in thousands of tons)	1.07%	5,200	4,873	4,900	5,083	5,145	5,010
Petroleum products (in thousands of barrels)[b]	−3.85%	2,000	1,990	2,050	2,100	2,080	1,898
Vendor performance[e]	25.45%	69%	66%	68%	71%	55%	52%
Building permits (in thousands)							
Residential housing units	−23.07%	3.208	1.388	1.416	2.513	4.170	2.521
Value of residential housing	9.19%	$341,112	$161,368	$119,906	$205,704	$312,391	$192,823
Value of nonresidential construction							
Industrial buildings	−49.50%	$13,414	$17,734	$7,496	$27,143	$26,564	$6,136
Office, banks, and professional buildings	154.93%	$91,781	$124,263	$17,165	$26,725	$36,002	$41,551
Stores and other mercantile buildings	4.81%	$37,818	$28,496	$13,003	$26,366	$36,081	$25,312
Other	6.42%	$5,003	$1,565	$1,968	$2,059	$4,701	$6,037
Consumer price index (1982–84 = 100)							
North Central US	3.61%	114.3	113.7	113.4	113.3	110.3	109.7
North Central/population more than 1,200,000	3.73%	115.1	114.7	114.1	113.9	111.0	110.5
North Central/population 360,000 to 1,200,000	3.81%	114.2	113.5	113.3	113.0	110.0	109.6
North Central/population 50,000 to 360,000	4.09%	114.6	113.4	113.4	113.6	110.1	109.0
North Central/population less than 50,000	2.37%	111.1	110.5	110.6	110.9	108.5	107.8
Chicago	4.10%	116.9	116.6	115.3	115.7	112.3	111.9
St. Louis	3.16%	114.2	—	113.4	—	110.7	—
		1987:IV	1987:III	1987:II	1987:I	1986:IV	1986:III
Personal income (in millions)[b,f,g]	6.96%	$192,858	$189,809	$187,750	$187,233	$180,304	$179,096
Per capita personal income[b,f,g]	6.66%	$16,607	$16,357	$16,191	$16,157	$15,571	$15,477

[a]Represents absolute change (percent change not relevant). [b]Recent month is preliminary figure. [c]The Conference Board, *Help Wanted Advertising*, March 1988. [d]Latest month projected by BEBR [e]Percentage of companies receiving slower deliveries [f]Seasonally adjusted at annual rates. [g]Percent change between 1986:IV and 1987:IV

Chart 1. Composite Leading Indicator
(average percent change in base indexes)

Mar 1986 — Jan 1987 — Jan 1988 — Mar 1988

Current Indicator   Trend Indicator
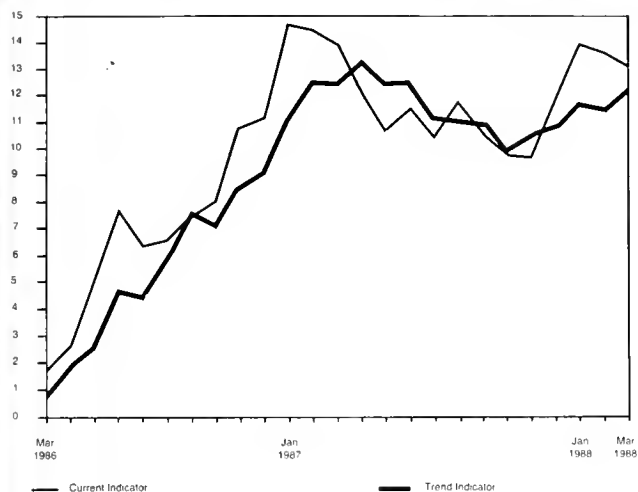
Chart 2. Nonagricultural Employment
(seasonally adjusted)

Mar 1986 — Jan 1987 — Jan 1988 — Mar 1988
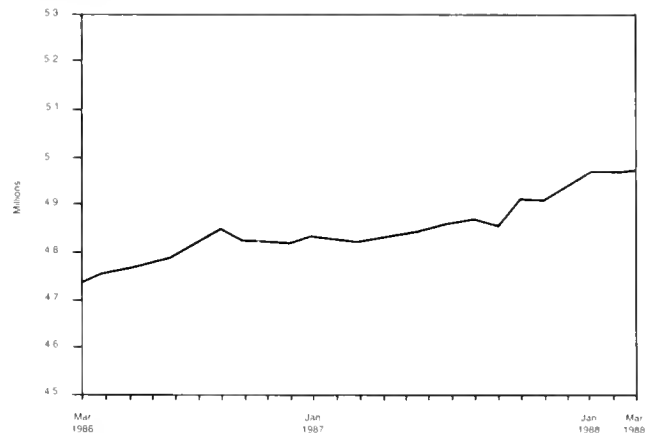
Chart 3. Manufacturing Employment
(seasonally adjusted)

Mar 1986 — Jan 1987 — Jan 1988 — Mar 1988
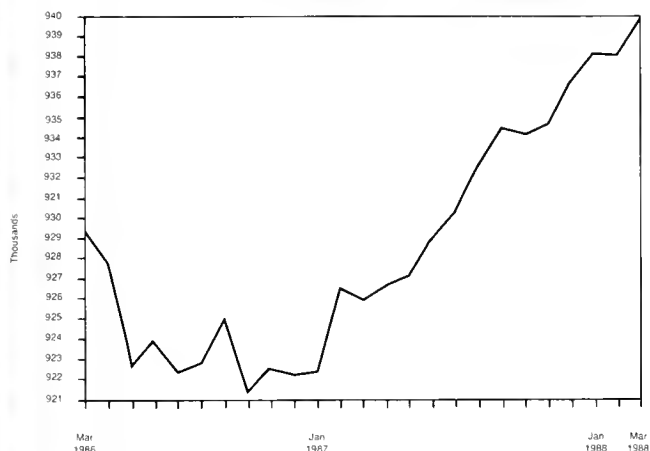
Chart 4. Durable Employment *(seasonally adjusted)*

Mar 1986 — Jan 1987 — Jan 1988 — Mar 1988
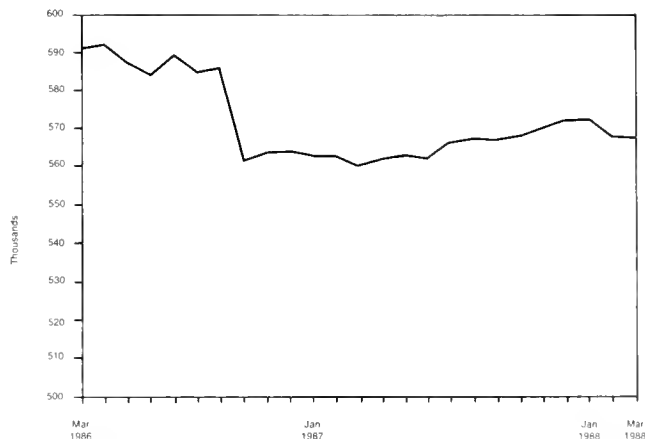
Chart 5. Unemployment Rates *(seasonally adjusted)*
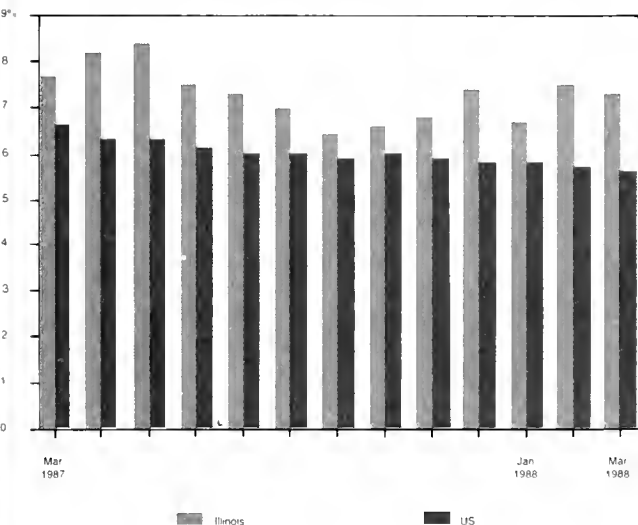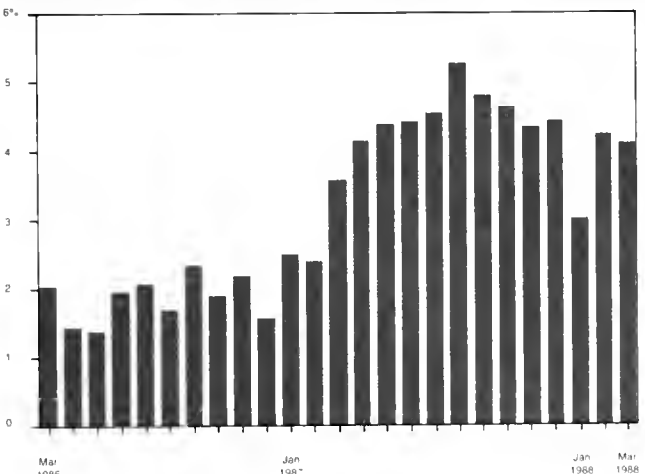
Mar 1987 — Jan 1988 — Mar 1988

Illinois   US

Chart 6. Year-to-Year Change in Chicago CPI

Mar 1986 — Jan 1987 — Jan 1988 — Mar 1988

15

Illinois Business Review

Bureau of Economic and Business Research

428 Commerce West, 1206 South Sixth Street

Champaign, Illinois 61820

Illinois Economic Outlook

The Illinois Econometric Model predicts a 5 percent growth in personal income during 1988. During 1987, nominal personal income increased by 4.8 percent. After adjusting for anticipated increases in the price level, a 5 percent expansion in nominal income translates into growth in real income of about 1.2 percent.

Most of the growth in state income results from growth in public utilities and transportation, services, and construction. The table summarizes the past and predicted behavior of nominal personal income in Illinois for each major sector.

Real personal income for the nation as a whole rose by 2.3 percent in 1987 and is expected to increase by about the same percentage in 1988. The chart indicates the relationship between changes in real income in the US and in Illinois. Changes in personal income in Illinois appear to follow those in US income. However, income fluctuations are more pronounced at the state level.

Real Personal Income Growth *(percentage change from previous quarter)*

Illinois Seasonally Adjusted Personal Income
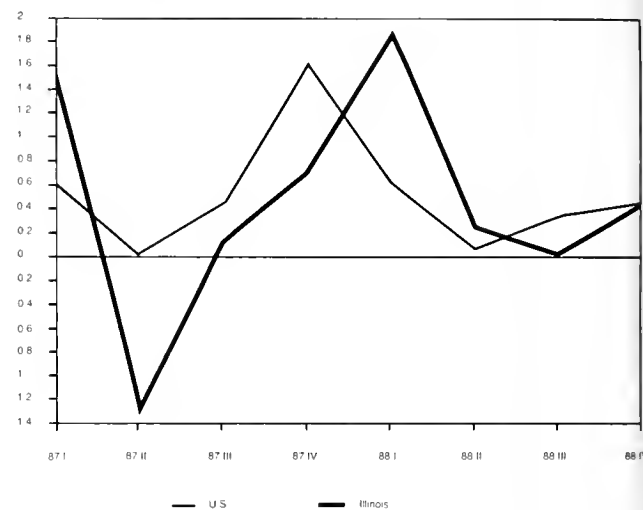
	History				Forecast			
	87:I	87:II	87:III	87:IV	88:I	88:II	88:III	88:IV
Total personal income (millions)	$187,815	$187,750	$189,809	$192,858	$197,982	$200,313	$202,351	$205,285
Private nonfarm	118,135	118,520	120,223	122,359	125,658	127,068	128,201	129,834
Mining	1,327	1,418	1,451	1,469	1,513	1,486	1,462	1,445
Construction	8,578	8,393	8,479	8,821	9,295	9,194	9,087	9,042
Manufacturing	29,262	28,777	29,038	29,504	30,308	30,478	30,663	30,846
Durable manufacturing	18,018	17,601	17,966	18,228	18,685	18,709	18,777	18,849
Nondurable manufacturing	11,244	11,176	11,072	11,276	11,623	11,786	11,885	11,996
Transportation and utilities	10,337	10,840	10,938	11,318	11,798	11,752	11,677	11,676
Wholesale and retail trade	23,398	23,690	24,088	24,321	24,698	25,080	25,470	25,873
Finance, insurance and real estate	12,773	12,531	12,820	12,973	13,223	13,479	13,639	13,927
Services	31,997	32,407	32,953	33,953	34,823	35,598	36,203	37,025

Bureau of Economic and Business Research

Illinois
Business

Review

HARRISON S. CAMPBELL, JR.

State and Regional Economic Impact Of Diamond-Star Motors

On 7 October 1985 the Chrysler Corporation and
Mitsubishi Motors Corporation of Japan announced a
joint venture to assemble automobiles in Bloomington,
Illinois. The Diamond-Star Motors Corporation was
thus established to produce 240,000 subcompact cars
per year beginning in September 1988. Construction of
the two million square foot plant began in April 1986
on 636 acres in western Bloomington and was
completed in March 1988.

The announcement of Diamond-Star's decision to
locate in Illinois came after the Illinois Department of
Commerce and Community Affairs extended $88.2
million of incentives in the form of training ($40
million), site acquisition ($11 million), highway
improvements ($25.8 million), and water and sewer
improvements ($11 million). Such incentive programs
have become more commonplace in the United States;
the *Chicago Tribune* has coined the phrase "Japan's
auto alley" to describe the recent emergence of Japanese
auto manufacturing stretching from Ontario, Canada,
to Smyrna, Tennessee.

While an auto assembly plant provides a textbook
example of the possible impact that a major employer
can have on a state or local economy, no comprehensive
study of the potential economic effects of Diamond-Star
has been published. This article provides an analysis of
the impact in three stages. First, the construction phase
of Diamond-Star will be analyzed at the regional level,
followed by an examination of the statewide effects of
Diamond-Star's operations phase. Finally, a multi-
regional analysis is conducted to demonstrate the
spatial distribution of economic impact.

Method of Assessment

The method used for this economic assessment was
the Conjoined Input-Output and Econometric Forecast
Model developed at Regional Economic Models, Inc.
(REMI). This model has been used in several states to
provide forecasts of economic activity. While there are
certain weaknesses associated with both input-output
and econometric techniques, their conjoined use helps
to overcome some of the inherent deficiencies of each.
For example, the national input-output table (which
simultaneously describes the interaction of industries,
governments, and households at the national level) is
adjusted to reflect the industrial structure of Illinois
through the application of industry-specific regional
purchase coefficients. After the initial impact is
estimated by the input-output model, each year's
forecast is simulated through supply and demand
values generated by the econometric model.

An attractive feature of the REMI model is its reliance on established theory. Unlike some econometric models, the embedded structural relationships reflect specific economic theory rather than purely statistical relationships or mere data availability. The methodology is internally consistent with neoclassical behavior and production theory. Therefore, firms are assumed to compete for scarce resources, and labor is assumed to move between industries and regions according to wage conditions.

Flexibility is built into the model in two ways. First, over 800 "policy" variables can be altered by the user. When appropriate information exists, industry-specific variables such as corporate tax rates, employment, export costs, unemployment compensation, and so on can be adjusted to coincide with prior information or the analyst's judgment. Second, the model allows the exogenous shock to be time-phased according to an expected production schedule. These factors suggest that the REMI model is well suited for studies of economic impact. However, REMI is a "black box" model; that is, it is an interactive computer model with its equations embedded in the program. While results of any simulation are dependent on parameters that reflect economic relationships, many of these parameters are inaccessible to the user. For example, recall that regional purchase coefficients are applied to "regionalize" the national input-output model. REMI estimated the regional purchase coefficients for the Passenger Motor Vehicles sector as .03, meaning that 3 percent of the inputs necessary to assemble a car are available in Illinois. Users do not have access to these values, however, and thus cannot change them to reflect changes in the state's ability to supply Illinois firms. This is unfortunate since many secondary effects are shown to occur in supplying industries.

Using the REMI model

When using any input-output model to conduct an impact study, the exogenous economic shock is modeled as a change in final demand for the output of the industrial sector of interest. Most input-output models are constructed using monetary values of input and output for the industries in the region, but employment or income values can be used similarly. For this study, employment data for the passenger motor vehicles sector were used to "drive" the model. While employment estimates for the operation phase were regularly published, similar data were needed for the construction phase if it was to be modeled separately. These data were estimated using the Illinois average construction expenditure split between labor and material expenditures (34 percent for labor, 66 percent for materials) to the total value of construction. The site estimator at Diamond-Star reported that construction laborers received approximately $15 per hour. This figure was then used with total labor costs to yield an estimate of total construction employees.

The operations of Diamond-Star are reported to begin at half capacity in 1988 and move to full capacity in 1989. Table 1 presents these employment figures as they were entered into the model. It was assumed that the transitional nature of the construction phase would not induce a migratory response. Accordingly, the wage response variable that reflects changes in the labor supply due to migration was "turned off." Thus, the supply/demand relationships do not change, and extraregional labor will not respond. During the operations phase, however, this variable was not altered, and wages and labor will respond according to their relative supply and demand in each industry.

Table 1. Driving the Model

| | Employment in Persons | |
	Construction	Operations
1986	483	–
1987	483	–
1988	–	1,450
1989	–	2,900
1990	–	2,900
1991	–	2,900
1992	–	
1993	–	
1994	–	
1995	–	2,900

Results from the REMI model

As noted above, the analysis of Diamond-Star and the construction project are presented at the regional, state, and multiregional levels. The Department of Commerce and Community Affairs has divided Illinois into seven regions based on commuting patterns. These regions are used for the regional analyses and are presented in the map.

Construction Phase

The analysis of the construction phase is restricted to Region 5 (see map) because most of the labor employed was assumed to be local. Labor from outside the region was used only in cases where the particular skill was not available locally. A conversation with the estimator at the Diamond-Star construction site revealed that this amounted to less than 5 percent of the construction labor employed.

Diamond-Star began plant construction in 1986, when 483 persons are estimated to be employed directly in construction while 149 are expected to be employed indirectly in supplying (intermediate) sectors and through induced consumer spending for a total of 632 (in this analysis, the present tense is used to describe the results obtained from modelling). By 1987, intermediate employment should increase slightly while the effects of local spending will bring total employment to 725. By 1988, the construction phase was finished. Accordingly, construction-induced spending and employment falls dramatically in 1988 to 110, with only 10 employed in intermediate sectors for a total of 120. By 1989, only residual construction employment will remain, and by 1991 employment impact for Region 5 will have been exhausted.

Illinois's Seven Commuting Regions
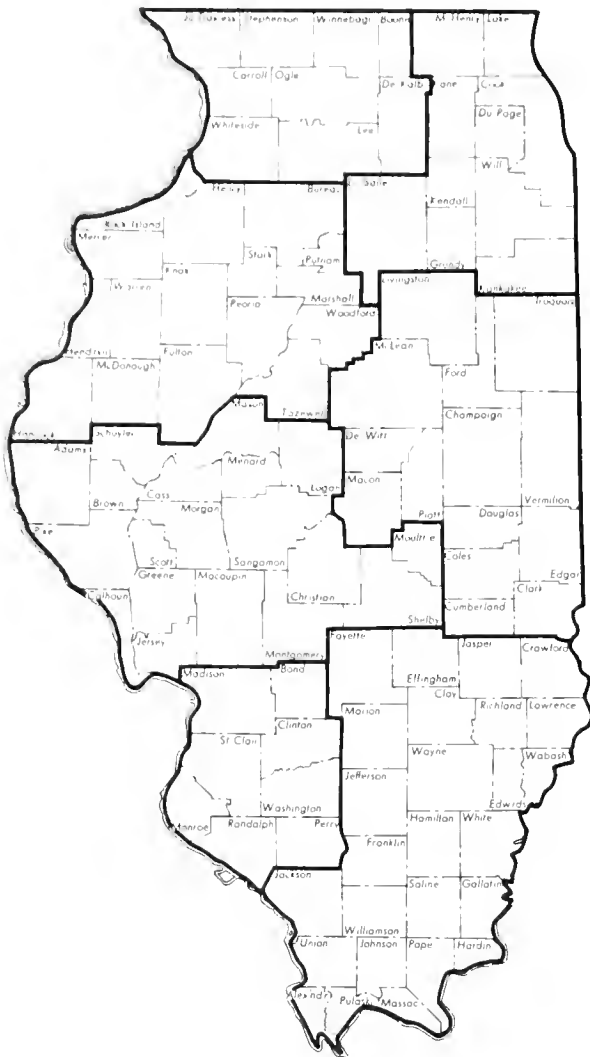
Department of Geography, University of Illinois

Wage and salary disbursements during the period are approximately $16.5 million in 1986 and $17.3 million in 1987, and fall to $3.3 million in 1988. As expected, this impact occurs primarily in the same sectors as employment (construction, durables, retail). By 1989 there is virtually no income impact visible, and the consumer price index is estimated to fall from a peak change in 1988 of .015 percent to less than .010 percent from 1990 to 1995.

In general, the bulk of the construction-related impact is contained within 1986–1988. This is to be expected in light of the date of operations at Diamond-Star. The transitional nature of construction projects implies that we should not expect employment induced by the construction project alone to be permanent.

Statewide Operations

An examination of employment effects by major sector reveals that the larger exogenous shock has a broader sectoral impact (see Table 2). In particular, the finance, insurance, and real estate, and wholesale sectors are now major sources of employment. State and local government impact is lagged by one year. There are also lagged structures in the finance, insurance, and real estate and service sectors where employment peaks at 493 and 1,895, respectively, in 1992, while total employment peaks in 1989. This may be due, in part, to the lagged nature of firms' behavior in expanding capacity. Firms with excess capacity may purchase few of these services while they move toward full capacity. Additions to capacity may involve more use of financial and business-oriented services in the form of employee compensation, insurance, management and information systems, and so on. It is also not too surprising that both the durable manufacturing and wholesale sectors peak in the same year as total employment as much of their initial increases in output are probably met by additions to labor rather than capital. Roughly 60 percent of the impact shown in Table 3 is attributable to intermediate and consumer demand.

The REMI model also generated employment demand by occupation through a link with the national Occupations by Industry Matrix. Of the 94 occupations generated, miscellaneous administrators and clerical workers are among the occupations experiencing demand in excess of 100 in 1987. Other occupations in high demand, such as secretaries and repair service persons, are vocational and semi-skilled. Professional occupations such as various engineering, health, technical, and research positions are in surprisingly low demand. For example, the demand for electrical engineers peaks at 17 in 1989 and falls to 7 in 1995.

Multiregional Impact

The multiregional impact of Diamond-Star is summarized in Table 3. The bulk of all the impact will occur in Regions 3 and 5. Together, they account for 94 percent of all employment and income and 96 percent of output generated. Of this, 30 percent, or roughly 2,500 jobs, are generated through induced consumer spending. Most of the effects of employment, income, and output are found in the durables, services, retail, and wholesale sectors.

The effects on the relative costs of production, however, are much more pronounced in Region 5. For example, in 1990 the cost of production in Region 3 is estimated to have increased by $260,000, where the same figure in Region 5 is over $4 million. Export employment will fall in all sectors except durable manufacturing in Region 5. The decline in export employment can be attributed to two factors. First, because the model assumes that firms are sensitive to factor costs, some firms may have left the region due to increases in production costs. However, because industrial output has also increased, it is possible that firms once producing for export have penetrated local markets and are now supplying other local firms. Thus, the fall in export employment does not necessarily imply a proportional loss of jobs.

Table 2. Statewide Employment Impact by Major Industry from Diamond-Star Production Phase[*]

	Total	Durables	Finance Insurance Real Estate	Retail	Wholesale	Service	Government
1987	3,526	1,749	171	347	265	664	0
1988	7,443	3,451	397	853	561	1,536	118
1989	7,821	3,361	461	984	581	1,762	249
1990	7,784	3,250	481	1,003	581	1,826	266
1991	7,680	3,132	492	998	576	1,877	262
1992	7,503	3,017	493	974	568	1,895	257
1993	7,280	2,911	486	941	556	1,881	250
1994	7,058	2,816	479	901	543	1,865	241
1995	6,860	2,734	480	873	524	1,841	232

[*]Because residual employment impact is felt on other sectors, sector totals do not sum to total impact

Table 3. Peak Aggregate Impact by Region[*]

Region	Employment (persons)	Income ($Billions '82)	Output ($Billions '82)
1	159	.009	.019
2	148	.010	.019
3	3,302	.251	.473
4	84	.008	.010
5	6,040	.429	1.273
6	56	.014	.020
7	87	.005	.012

Regional impact peaks in different years. Thus, column totals do not equal state totals.

The impact on state and local government and service and retail sectors are mirrored by population response in Region 5. By 1991, it is estimated that this region will be a net gainer of population of almost 5,000. The consumer price index is estimated to increase by 1.7 percentage points through the forecast period. Rising rates of inflation are a common by-product of rapidly increasing demand, and the residents of this region should expect an inflationary period starting in 1991.

While we should expect many of the economic effects to occur in the region of impact, the concentration of impact in the Chicago region illustrates the strength of its economic links and its industrial dominance over other regions. Because Regions 3 and 5 already have the highest per capita incomes and receive the largest impact from Diamond-Star, effects there will only marginally affect regional economic imbalances in Illinois.

The impact to Regions 1, 2, and 6 is smaller than that of Regions 3 and 5 by at least a factor of ten. Only 5 percent of the employment and income effects and 3 percent of the output effects reach these regions combined. This impact is negligible. Region 1 experiences the greatest employment impact of the three in 1990 when employment increases by 159. Income and output impacts are greatest in Region 6, but these only amount to increases of 0.3 percent and 0.1 percent, respectively, of their 1985 levels. Income effects are partially off-set by a modest increase in the rate of inflation. In Region 1, increases in disposable income peak at $7 million in 1991. However, population is forecast to reach nearly 636,000 in total. Thus, additions to per capita income equal only $11. The cost

of production rises slightly over the forecast period, and labor intensity drops. But in both cases they are insignificant. In general, according to this forecast, these regions have little to gain from the Diamond-Star Operation.

Regions 4 and 7 are the regions least affected by the Diamond-Star project. Although they share geographic borders with Region 5, they are economically the most distant from it. This is primarily due to the paucity of durable manufacturing and wholesale industries, which have been shown to be highly linked to the economic activity in Region 5. In fact, these regions seem to have no particular relative concentration of any industry. Although the regions are forecast to experience marginal income effects, these will be more than off-set by the resulting rate of inflation. Any population increase, and there is some anticipated, will probably be due to natural increase rather than net in-migration.

Concluding Remarks

The purpose of this study has been to assess the economic impact of Diamond-Star on Illinois and its seven regions. Implicit in this report are assumptions that Diamond-Star will reach full production according to their anticipated production schedule and that the autos assembled there will be competitive and successful in the American market. No attempt has been made to simulate the impact of Diamond-Star if it does not reach full production or, conversely, if output exceeds the predicted 240,000 autos per year.

It has been reported, however, that 40-60 percent of the inputs used by Diamond Star will be imported from Japan. Among those imported inputs are engines, transmissions, and various plastic components. This will have significant consequences for the amount of impact we should expect from Diamond-Star. The importance of intermediate and consumption-induced employment and income have been demonstrated, and the importation of large quantities of inputs implies that many of Diamond-Star's indirect effects will not be realized. This fact points to the opportunity for

policies and strategies designed both to enhance the total impact of Diamond-Star and to lessen regional disparities in the state. The encouragement and marketing of firms to supply Diamond-Star located in other regions of Illinois will contribute to a more equal geographical distribution of wealth and employment opportunity. Considering the expectation of imported inputs, the figures presented in this report should be considered upper bounds to the ultimate impact.

The study illustrates the relationship between employment and income and the importance of household spending in generating employment. The spending of wages and salaries has been shown to account for approximately 30 percent of the employment impact. The only policy implication is that the location of suppliers as well as the potential for income generation of major employers should be considered as important criteria as are employment estimates when directing state monies to attract big business.

Harrison S. Campbell, Jr. is a program and policy analyst with the Institute of Government and Public Affairs at the University of Illinois at Urbana-Champaign. The research for this report was conducted while he as a graduate student in the Department of Geography at the university.

BARBARA J. THOMAS and BARBARA F. RESKIN

Change and Sex Integration in Real Estate Sales

The field of residential real estate sales has been open to women for years. In fact, in 1933 the Virginia State Board of Education characterized residential sales as "an appropriate occupation for women." However, women have always been a minority of real estate sales people. Labor shortages during World War II first brought significant numbers of women into the occupation, and after 1950 one in every seven brokers and sales people was female. Women's representation among brokers and salespersons grew steadily over the next 20 years and then increased sharply during the 1970s (see Table 1). By 1980, over half of all agents and brokers were women. Why did the sex composition of real estate sales people change so dramatically? To answer this question, we examine changes in the industry and occupation, using recent survey data from the National Association of Realtors® and the Illinois Association of Realtors, government publications and other documentary sources, and interviews with Illinois real estate sales people.

Table 1. Employment in Real Estate Sales, by Sex: 1970, 1972, 1977–1981 (*in thousands*)

	Males	Change	Females	Change	Percent Female
1970	178	—	84	—	31.9
1972	221	43	128	44	36.7
1977	282	61	220	92	43.8
1978	305	23	250	30	45.0
1979	312	7	304	54	49.4
1980	287	−25	295	−9	50.7
1981	282	−5	280	−15	49.8

Source: US Bureau of the Census, 1973, 1978, 1979, 1980, 1981.

Real estate agents include sales people and brokers, who, together, made up 88 percent of all workers in real estate sales occupations in 1980 (see Table 2). Agents enter the occupation by acquiring a sales license. Some later earn a broker's license, which permits them to carry out certain transactions and manage real estate firms. Most sales people begin in residential sales, and the majority of sales people (82 percent) and brokers (68 percent) remain in that specialty. The primary alternative is commercial sales, which deals with income-producing property such as shopping malls, office buildings, and residential units. A major attraction of commercial over residential real estate is its higher earnings. Commercial brokers earn the second highest median income among the specialties (see Table 3). In addition, since commercial agents deal with business properties, they are less likely to work evenings and weekends. Those selling residential real estate spend most of their time obtaining listings—often on the telephone—and showing property.

Table 2. Total Employment in the Real Estate Industry and Employment of Brokers and Salespersons, 1960–1982

	Total Employment[a] (in thousands)	Percent Change over Previous Five Years	Real Estate Brokers and Salespersons (in thousands)	Percent Change
1960	750	—	—	—
1965	795	6.0	—	—
1970	881	10.8	262[b]	—
1975	1,054	19.6	422	61.1
1980	1,384	31.3	598	41.7
1982	1,336	–3.5	534	–10.7

[a]Source: US Department of Labor, 1984.
[b]Source: Bureau of Census, 1973

Table 3. Median Income of Brokers by Primary Business Specialty, 1974–1983

Business Specialty	1974	1980[a]	1974–80 Decline in Real Income (%)	1983[a]	1974–83 Decline in Real Income (%)
Residential	$20,000	$15,135	24.3	$12,370	38.2
Commercial	30,000	23,740	20.9	23,460	21.8
Industrial	25,000	22,365	10.5	NA	NA
Farm & land	22,000	19,854	9.8	13,860	37.0
Property management	25,000	20,631	17.5	21,380	14.5
Appraising	25,000	20,930	16.3	14,850	40.6
Building & development	33,500	24,279	27.5	24,750	26.1
Syndication	NA	NA	NA	NA	NA
Other	28,000	20,452	27.0	NA	NA
All brokers	24,000	17,282	28.0	14,850	38.1
N	NA	NA		1,154	

[a]In 1974 dollars
NA—Not available.
Source: National Association of Realtors[b].

men. Because earnings are based primarily on commissions, we must ask whether performance differences account for this wage gap. However, within residential sales in 1983 full-time saleswomen in a national sample of real estate sales people earned 90 percent of what similar men earned. Wage data suggest that a more important factor is sex segregation within real estate sales. Residential sales, in which women are concentrated, yields the lowest average income of all specialties. Moreover, brokers, most of whom are male, typically out earn salespeople (see Table 3). Furthermore, among brokers the gap between male and female earnings is larger than the gap for all real estate salespeople—a woman broker averages 55 cents for every dollar a male broker makes.

Within real estate sales the sexes are segregated in two ways. First, women and men are concentrated into different occupational specialties, with most women in residential sales and men dominating the more highly rewarded nonresidential specialties. Second, they hold different positions. Women work disproportionately as sales people, while men hold most managerial (broker-manager) positions. In a survey of 664 Illinois sales people, fewer than 4 percent of the female respondents worked in nonresidential specialties, compared to 21 percent of the men. With respect to positions, of the survey respondents women were 62 percent of the salespersons but only one-fifth of the brokers, compared to 44 and 40 percent, respectively, of the men. Although any salesperson can take the classes and the examination for a broker's license—and more women are doing so—women's limited opportunities to become broker-managers (among Illinois brokers and sales people, women who held brokers' licenses were half again as likely as similar men to be associate brokers rather than broker-managers) reduce their incentive to get a broker's license.

Sex segregation is linked to the wage gap between real estate saleswomen and men. In 1980 women in real estate sales averaged 65 percent of what men earned, which was only two cents per dollar better than how all women in the labor force fared compared to all

Explaining the Changing Feminization of Residential Real Estate Sales

Women's increasing representation among real estate sales staff reflects a growing demand for salespeople that men could not satisfy, the attraction real estate sales held for women, and occupational changes that facilitated women's entry into the occupation. Demand factors are necessarily more important—the shortage of agents itself helped produce the supply of women eager to try their hand at selling real estate—so we begin by considering the factors that enhanced the demand for women in real estate sales.

Factors Increasing the Demand for Women in Real Estate Sales

Between 1960 and 1980 the real estate industry thrived, and this long period of growth created a demand for sales staff. In the 1970s the employment of real estate sales people and brokers more than doubled (see Table 2). After World War II returning servicemen eligible for FHA mortgages created a boom in the housing market. The growing industry depleted the primary source of sales people—men—and fueled the demand for an alternative labor supply. The industry underwent several major changes including economic fluctuations, invasion by franchised chains and

conglomerates, transformation of the employment status of sales people, stiffer licensing requirements, and new paths into the occupation. All these events affected the sex composition of real estate sales personnel: some made real estate sales less attractive to men, thereby creating a demand for women; others made it more accessible to women.

Responses to Economic Uncertainty and Shifting Competitive Conditions

The residential brokerage industry has always been vulnerable to economic fluctuations. The growth of nationally franchised firms such as Century 21 and national conglomerates such as Coldwell Banker and Merrill Lynch in the 1970s contributed to the shifting sex composition by creating a large number of new sales positions. In 1972, Century 21 was founded, and by 1981 there were seven national chains and 48 regional operations. Profit-sharing agreements give these chains an incentive to acquire a large sales force without any countervailing economic disincentives. To do this, they developed recruitment programs with features likely to attract women.

Education, Licensing, and Entry into Real Estate Sales

All states require real estate agents to be licensed. To qualify, an applicant must be a high school graduate, and most states require 30 hours of classroom instruction to take the licensing examination. High schools, vocational schools, colleges, universities, and real estate firms offer courses in real estate. Applicants must pass a written test; and before a license is issued, they must submit the name of the broker with whom they will be associated. Employers emphasize personality traits as "fully as important as academic background." Compared to many comparable white-collar occupations, these entry requirements are not demanding and make real estate relatively accessible to persons who do not have a college degree or the opportunity to undertake extensive training before embarking on a new career. These characteristics describe many older women who entered or reentered the labor force during the 1970s.

The increased educational requirements for the license that most states imposed in the early 1970s may have attracted women to real estate sales, because they gave rise to community college courses widely advertised in college catalogs. Before such courses were available, prospective sales people who needed help in their studies had to turn to a licensed salesperson—who was usually male. To the extent that sex discrimination existed, this system put women at a disadvantage. The development of college classes created a formal channel into the occupation. As one male broker we interviewed put it, "We set up a mechanism for people to get into

this business that worked for men and women, and there were a lot more women out there at the time who wanted to get in . . . if they knew how to." Increased educational requirements and high-visibility advertising campaigns also improved the image of real estate sales, and this more professional image attracted several of the women we interviewed.

Employee versus Independent Status

Sales people are associated with brokerage firms either as employees or as independent contractors. If the arrangement with the broker permits the sales people to work when they please, and if they are permitted to find their own prospects and generally work on their own, their status is that of an independent contractor. As independent contractors, sales people must pay their own withholding taxes and secure their own health insurance and retirement plans. They must also assume the transportation costs incurred in showing property. In the 1970s the federal government increased its regulation of brokerages, and in 1982 the Tax Equity and Fiscal Responsibility Act (TEFRA) imposed requirements for independent-contractor status to ensure that sales people would not be treated as employees for federal tax purposes. This act encouraged brokers to shift employees to independent-contractor status. Such a change was in firms' interest because it saved them the expense of social security, unemployment insurance coverage, pension plans, and fringe benefits. Subsequently, this simplified bookkeeping and the costs associated with it. Now over 90 percent of brokerages use independent contractors exclusively.

The shift of sales people from employees to independent contractors, who received neither salary nor benefits, made real estate sales less attractive to primary wage earners who are predominantly male. Since women in the social classes from which real estate sales people are drawn are less likely than men to be primary wage earners, and married women can usually rely on their husbands' regular income and are covered by their health insurance, independent-contractor status appears to be less of a deterrent to women than to men. In addition, by reducing firms' personnel costs, the independent-contractor system reduced firms' economic disincentives associated with hiring workers whose productivity sex stereotypes might have prompted brokers to question. An 11-year female sales veteran, who began selling residential real estate when other industries were reluctant to hire a woman with a baby for a sales position, illustrates this point, "Real estate people didn't inquire into my personal life or question my ability to put in enough time because [I didn't] get a salary."

The economic fluctuations of the late 1970s exacerbated the negative effect that shifting employees to independent-contractor status had on attracting men since they made commission-based earnings less popular with prime wage earners. After 1974 real median income declined more in residential sales than in commercial and most other specialties (see Table 3).

Thus, new and more highly rewarded real estate specialties, such as condominiums, cooperative management, and syndication, attracted men away from residential sales, leaving vacancies that women filled.

Cultural Attitudes, Occupational Sex Labelling and Discrimination

Industry informants reported that in the past many firms refused to hire women and that some residential customers preferred male sales people. In addition, until the 1960s employment outside the home was not generally acceptable for middle class married women, especially mothers, and firms discriminated against such women. One interviewee told us, "If they had a grade school kid, even a high school kid, we wouldn't let them in real estate in those days." The increasing need for two incomes in a household and the women's liberation movement jointly eroded such attitudes and, along with the economic downturn of the 1970s, prompted public acceptance of the employment of married women with children.

Those forces and the pressure they engendered for equal opportunity led firms that had previously barred women to hire one or two in residential sales. According to agents we spoke with, the success of these pioneers weakened any remaining resistance. In fact, several brokers we interviewed described the ideal residential salesperson as female—a young married women with children and a successful husband—because they assumed she would be energetic, well organized, have contacts, and be used to nice possessions. Thus, residential sales is being relabelled as "women's work."

Explaining the Increased Supply of Women Available for Residential Sales

At the same time that the demand for women salespersons was growing, so too was the supply of women interested in selling residential real estate. The number of women in the labor force grew dramatically during the late 1960s and early 1970s, producing thousands of new workers on which occupations could draw. A variety of factors channeled significant numbers of this group into residential sales.

Sex-role Socialization. Traditional sex-role stereotypes are important in relegating women to residential sales. Personality traits thought to be related to success in residential sales are consistent with traditional female sex roles. In its 1933 edition of *Vocations for Women*, the Virginia State Board of Education listed as qualifications for real estate sales: tact, a pleasing personality, confidence, initiative, good judgment, and the ability to work harmoniously with various classes of people, all characteristics stereotypically associated with women. One commentator claimed that women know how to sell houses because they understand "feminine psychology" better than men and can point out a home's advantages from a woman's point of view. He contended that this is important because ultimately most wives decide which house to buy. Other stereotypically female traits that

are useful in residential sales include diplomacy, a desire to please, and nurturance. In many respects, residential sales involves "emotional work," the production of emotions in oneself and others, which is a traditionally female form of work. Salespersons we interviewed illustrated this idea, pointing out that women are more patient when buyers are trying to reach a decision. In one's words, "They're willing to wait while someone discusses their ambivalence about a yellow bathroom." Moreover, the traditional sexual division of labor that assigns to women the primary responsibility for home care ensures women's interest in houses, and hence their expertise and legitimacy in the minds of buyers. A successful woman broker pointed out, "Women come into real estate knowing how many cupboards a kitchen should have in order to store a respectable number of pots, pans, and staples. . . . They know a lot about houses—more than most men. That's why they do so well."

Knowledge of the Occupation. Women have several ways in which they can learn about career possibilities in residential sales: when they buy or sell a home; from working in a nonsales job in a real estate firm; from seeing women realtors in television commercials or magazine advertisements; from recruitment efforts by firms; through friends and relatives; and from junior college and university course catalogs. As more women sold real estate in the 1950s and 1960s, more female role models were available to women looking for an occupation. To the millions of American women who buy or sell homes every year, real estate sales appears to be a lucrative occupation that does not require specialized training. After 1971, even women who had never personally come into contact with a female realtor saw women selling houses in television commercials for national franchises or in photographs of real estate sales personnel in newspaper home-buyer guides.

Flexible Working Hours. As independent contractors, salespersons are free to make their own schedules and do not need to ask permission to take time off. A job that does not require a 9-to-5 workday, 50 weeks a year is attractive to women with family responsibilities. For example, in 1960 a commentator characterized residential real estate as a "natural field for women," since it provides the flexibility many occupations lack to schedule appointments to accommodate domestic responsibilities. When asked what attracted them to the field, more women we interviewed mentioned flexibility and independence than any other factor. For example, a broker who had been a teacher said she wanted to return to work when her youngest child entered kindergarten, "and real estate had more flexible hours than teaching." Another summarized the typical woman's reasoning as, "I'll go out and sell houses while Susie and Johnny are in school. I can be home when they get home so it won't disrupt my family life."

Thus, newcomers are attracted by the perception that real estate sales will accommodate their family roles. This image is not totally well founded. Customers call agents in the evenings and on weekends, and agents spoke of long work weeks spilling over into weekends. However, even if residential sales is less flexible than many newcomers believe, independent-contractor status does let women take off blocks of time to schedule family events if they can get a colleague to cover for them. Thus, both perceived and actual flexibility contribute to the occupation's attraction for women with families.

Income Advantages. Real estate sales offers three potential income advantages to women. First, many women mentioned the attraction of a job in which their income is not depressed by their sex. As a recent college graduate said, "We don't have to battle for equal pay for equal work in this business. There's no rule, thank God, that if a sale is made by a man the commission will be 6 percent, if by a women, 3 percent." Although payment based on commissions precludes wage discrimination, it does mean an irregular income. However, this problem is less serious for persons who are not the sole support for themselves and their families. Thus, real estate may be particularly attractive to married women whose husbands earn enough to sustain their families.

Second, as independent contractors, real estate agents work on a commission basis, receiving a percentage of the sale price of their listings and sales. Thus, only time and energy restrict their earnings. Several saleswomen indicated that their overall earnings are higher than they had been in their previous jobs or other jobs for which they felt qualified. One said, "If I had stayed in elementary teaching, I probably wouldn't make [even] 50 percent of what I do." Indeed, real estate sales provides above average wages for women. In 1980 the mean hourly earning of women in real estate sales was $7.19, while experienced female members of the civil labor force averaged $6.10 an hour. The potential gain is even greater for secretaries and bookkeepers, the most common occupational origin for real estate salespeople. In 1980 female secretaries and bookkeepers made $5.14 and $4.98 an hour, respectively.

A third attraction is the popular belief that real estate sales is a very lucrative occupation, fostered by books such as *How Any Woman Can Get Rich Fast in Real Estate.*

Explaining Women's Underrepresentation in Nonresidential Real Estate

Because it is easy to enter, residential sales is the "port of entry" into real estate sales. Many men tend to move on into nonresidential sales and management, but most women remain in residential. Women's underrepresentation in commercial sales occurs both because the field is still sex-typed as a male field and because it is more difficult to enter. A commercial license requires more classroom hours as well as business and mathematical training. Because custom has discouraged women from pursuing business and mathematics in school, these requirements are more likely to deter women than men.

Cultural Attitudes, Occupational Preferences, and Sex-Role Socialization. Industry insiders still see commercial sales as a male specialty. For example, one interviewee remarked, "I think a good number of men would feel that (commercial) is a man's field and that they can do a better job." Commercial sales has the reputation as a tough, risky business where deals are made in smoke-filled rooms. Some informants characterized men in commercial sales as "high rollers" who are attracted by the risk that commercial real estate involves.

Explaining women's underrepresentation in nonresidential sales and their gains in residential real estate in terms of sex-role socialization is appealing because it fits popular notions of how people behave, but structural aspects of the occupation are also important in producing sex segregation within real estate sales. For example, just as many women learned about opportunities in residential real estate through buying and selling houses, the commercial sales people whom we interviewed learned about their occupation through buying a selling investment property or managing property. Because these are not typically female activities, women have fewer chances to learn of the opportunities commercial real estate sales offer. In addition, most people we interviewed agreed that some brokers refused to hire women for commercial sales, and others would only allow a small percentage of women in their branches. Some saleswomen told us that brokers did not want women on their staffs because they did not think women could handle commercial. For example, one saleswoman experienced opposition when she tried to move from residential to commercial sales, after she had a chance opportunity to handle a commercial sale. "The men in the office didn't let me do it. My boss said, 'If you want to do that, go someplace else, because that's no place for a woman.' " Another saleswomen said her firm's executive committee had to approve her when she was hired in 1973: "All the men went in (easily) . . . with me it was five months." Several brokers we interviewed confirmed these accounts of sex discrimination in commercial real estate; a male broker indicated that many commercial firms that appear open to women are just paying "lip service" to equal opportunities for women.

Most agents we interviewed believed that commercial customers, who are predominantly male, are indifferent to a salesperson's sex as long as she or he is competent, although a few claimed that customers still prefer to deal with men and that women in commercial must prove themselves by being more professional than their male counterparts. Some of the barriers women described to us were subtle. Some commented that female agents must act differently from male agents— they cannot be "buddy-buddy" with their customers, conducting business at the golf course or bar. Thus, according to our sources, would-be commercial saleswomen have to overcome more resistance from employers than from customers.

TIMOTHY J. GALLAGHER

Mutual Fund Size and Risk-Adjusted Performance

The *Wall Street Journal* described the ongoing debate over the relationship between mutual fund size and performance in the 5 June 1986 edition. Laura Berger of the No Load Mutual Fund Association was quoted as saying, "The smaller the fund the better the performance." A study conducted by Lipper Analytical Services was quoted, and it found that larger funds outperformed smaller funds in four of five categories tested.

There are many people, such as Berger, who have a gut feeling that small mutual funds should outperform large mutual funds. The flexibility of smaller funds is often referred to as a big advantage. The manager of a small fund can get in and out of the market quickly without disrupting it. He can also move from one stock to another easily. Buy and sell orders are not likely to move the market adversely, resulting in better "fills" for the small fund.

Large funds have more resources and can afford to buy the services of the highest priced (best?) portfolio managers. They can negotiate lower commission charges and can take advantage of economies of scale. The Lipper study suggests that these advantages of large funds outweigh the relative advantage of which small funds have in certain areas.

The Lipper study has one serious limitation. It does not adjust for risk when measuring performance. Funds that take bigger risks should perform better than funds that take smaller risks. Rather than making subjective judgments about the relationship between size and performance or doing a study using simple returns to measure performance, this study examines the relationship between size and risk-adjusted returns.

Risk-Adjusted Returns of Mutual Funds

Performance figures were gathered quarterly for 45 mutual funds and the Standard & Poor's 500 Index from Barron's/Lipper Gauge of mutual fund performance. The Lipper Gauge reports the performance of a hypothetical $10,000 investment during a given holding period (quarter, year, and 5-year periods). The ending value of this $10,000-beginning-value investment is reported. Sales charges and redemption fees, if any, are ignored. All distributions are assumed reinvested on the ex-dividend date. Holding-period returns (Ending Value − $10,000/$10,000) were calculated for mutual funds for each quarter from 1 January 1982 through 31 March 1987 (22 quarters). The first quarter of 1982 is when *Barrons* began publishing the Lipper Gauge.

The 22 holding-period returns were obtained, and the geometric mean of these returns was calculated for each mutual fund in the sample. Maximizing the geometric mean return for a given risk level is widely accepted as a good investment goal.

The geometric mean returns were then used to calculate two different risk-adjusted return measures for each mutual fund. In both cases, the risk premium for each mutual fund is computed. It is defined as the geometric mean rate of return minus the riskless rate of interest. On 1 January 1982 an investor could have purchased a Treasury bond scheduled to mature in March 1987 with a yield to maturity of 14 percent. This yield, converted to a quarterly return of 3.3 percent, becomes the riskless rate.

The Sharpe Index takes the risk premium and divides by the standard deviation of the holding-period returns. The Sharpe Index gives us the amount of return above the riskless rate paid to induce investors to assume risk per unit of total risk. In the ex-post world we live in, this risk premium can be positive or negative. Ex ante, the expected risk premium is always positive.

Treynor uses the same numerator in his performance index. However, instead of dividing by the total risk measure he uses beta in the denominator. The Treynor Index gives the risk premium per unit of systematic risk. Beta was calculated by regressing the holding-period returns of each mutual fund against the holding-period returns of the Standard & Poor's 500 Index with dividends fully reinvested.

The size variable used in this study reflects the dollar amount of total assets of each mutual fund at the beginning of the observation period (31 December 1981). Although the sizes of these sample mutual funds changed over the observation period, a potential investor could not predict these changes; so the beginning size figures were used.

The 45 funds are ranked according to asset size from largest (rank 1) to smallest (rank 45). Each fund (including Standard & Poor's 500 Index) is then ranked according to performance from best (rank 1) to poorest (rank 46) Performance is measured in three different ways: the geometric mean holding-period return, the Sharpe Index, and the Treynor Index. The Pearson correlation coefficient is calculated to test for a possible relationship between mutual fund size and performance.

Results

Table 1 shows the geometric mean returns, betas, the Sharpe Index, and the Treynor Index for each of the 46 funds. The best performer, without adjustment for risk, was Sentinal with an 8.37 percent geometric mean quarterly return. 44 Wall Street fund was the poorest performer with a −2.32 percent geometric mean quarterly return. The geometric mean quarterly return of the Standard & Poor's 500 Index (with dividends reinvested) was 5.36 percent. Of the 45 sample mutual funds, 31 beat this benchmark buy-and-hold portfolio on an unadjusted basis.

Sequoia, not Sentinal, gets the number one ranking when the Sharpe and Treynor risk-adjusted performance measures are examined. Sentinal drops to number three according to the Sharpe Index and to number six according to the Treynor Index. Sequoia had a value of .78 for the Sharpe Index and 13.30 for the Treynor Index. 44 Wall Street had a −2.32 percent quarterly geometric mean, a −.28 for the Sharpe Index, and −3.36 for the Treynor Index coming in at last place however performance is measured. The Standard & Poor's 500 Index reinvested was 2.06. The Standard & Poor's Index reinvested beat 31 of 45 mutual funds in this random sample according to the geometric mean, 34 of 45 according to the Sharpe Index, and 39 of 45 according to the Treynor Index. The mutual fund managers seem to be doing very well, especially on a risk-adjusted basis, according to these data. Next the evidence on the relationship between mutual fund size and performance will be examined.

The results of the correlation coefficient calculations are summarized in Table 2. The null hypothesis is that there is no relationship between size and performance. Only the .311 correlation coefficient of geometric mean and size is significant at the .05 level suggesting that there is significant difference between the performance of small and large funds (large funds do better). The results from the risk-adjusted performance measures suggest that the null hypothesis (no relationship between mutual fund size and performance) cannot be rejected at the .05 level of confidence.

The Sharpe and Treynor Indexes are both widely used as measures of risk-adjusted performance. They tend to rank portfolios similarly, and the results of this study support that observation strongly. The rank correlation coefficient between the Sharpe Index and the Treynor Index is .869. The probability that this correlation coefficient is in fact zero is .0001.

Table 1. Quarterly Performance of 46 Funds 1982:I to 1987:II

Mutual Fund Name	Asset Size ($mil)	Size Rank	Geometric Mean Return (%)	GMean Rank	Beta	STD	Sharpe Index	Sharpe Rank	Treynor Index	Treynor Rank
Acorn	105.9	27	6.43	18	.93	10.11	.31	21	3.37	29
Affiliated	1580.6	3	7.35	10	.67	8.74	.46	11	6.00	15
Amer. Leaders	43.2	35	6.93	14	.53	6.42	.57	6	6.84	12
Axe-Houghton	141.5	22	6.84	15	.64	8.16	.43	15	5.52	17
Commerce Inc.	46.8	34	5.12	35	.69	6.85	.27	29	2.63	37
Composite	24.1	39	4.61	42	.39	6.71	.20	39	3.41	28
Decatur Inc	359.2	13	7.53	5	.55	7.30	.58	5	7.75	8
Delaware	226.8	18	7.44	9	.94	10.33	.40	17	4.43	25
Dreyfus A Bond+	25.2	39	4.60	43	.21	4.56	.28	24	6.20	14
Dreyfus	1635.9	1	5.71	29	.53	7.58	.32	20	4.53	24
Elfun Trusts	265.0	16.5	7.12	11	.81	8.80	.43	14	4.71	23
Fidelity Fund	490.2	8	7.48	8	.85	9.81	.43	16	4.95	22
Fidelity Trend	537.1	7	6.07	22	.93	10.84	.26	33	2.96	33
1st Inv Growth	58.4	31	2.86	45	1.21	13.25	-.03	45	- .36	44
44 Wall Street	122.2	25	- 2.32	46	1.67	19.73	.28	46	- 3.36	46
Fund Us Govt	48.5	33	4.65	41	.16	6.05	.22	38	8.63	3
J Hancock Bond	325.0	14	4.85	40	.21	5.11	.30	2	7.33	9
Hartwell Growth	8.7	42	5.51	30	1.27	17.09	.13	43	1.74	43
IDS Bond	580.4	6	6.48	17	.37	6.70	.45	12	8.51	4
Inc. Fd. of Amer	216.2	19	6.58	16	.42	5.64	.58	4	7.83	7
Inv. Co of Amer	1592.4	2	7.80	3	.86	8.29	.54	7	5.25	20
ISI Growth	13.3	41	5.14	34	.50	7.16	.26	32	3.66	26
ISI Income	8.2	44	3.18	44	.08	5.32	- .02	44	- 1.50	45
Janus	40.6	36	5.79	28	.84	8.83	.28	26	2.98	32
Kempr Inc.	78.5	29	5.11	36	.17	4.98	.36	18	10.74	2
Keystone B-4	360.7	12	4.93	37	.31	4.55	.36	19	5.26	19
Putnam Growth	651.3	5	7.01	13	.59	7.85	.47	9	6.35	13
Putnam Income	122.0	26	4.93	38	.31	6.19	.26	30	5.28	18
Safeco Equity	31.5	37	6.05	23	.78	9.92	.28	27	3.64	27
Security Equity	198.3	21	6.05	24	.99	11.47	.24	36	2.77	36
Sel. Amer. Shs.	72.2	30	7.54	4	.51	6.85	.62	2	8.30	5
Sentinal Cm St.	265.0	16.5	8.37	1	.63	8.44	.60	3	8.06	6
Sequoia	134.1	23	7.84	2	.34	5.85	.78	1	13.30	1
Sigma Income	15.3	40	4.87	39	.31	5.87	.27	28	5.16	21
Smith Barn Eq.	50.5	32	6.10	21	.87	9.89	.28	25	3.22	31
Sov Investors	8.5	43	7.10	12	.53	8.15	.47	10	7.25	10
St. Farm Growth	199.2	20	5.47	31	.88	9.76	.22	37	2.46	39
St. Farm Inv.	389.4	10	6.01	25	.93	10.61	.26	34	2.90	35
Stein Roe Cap	126.6	24	5.84	27	1.41	17.34	.15	42	1.81	42
Surveyor Fund	89.3	28	5.98	26	1.37	15.46	.17	41	1.96	41
Technology Fund	478.8	9	6.36	19	1.04	11.74	.26	31	2.94	34
20th Cen. Growth	281.3	15	6.32	20	1.23	15.74	.19	40	2.47	38
Unified Mutual	7.1	45	5.32	33	.62	7.08	.29	23	3.24	30
United Accu.	396.8	11	7.51	6	.75	9.37	.45	13	5.62	16
Windsor Fund	960.8	4	7.49	7	.60	8.23	.51	8	7.03	11
S&P500 Index (Div Reinvested)	–	–	5.36	32	1.00	8.15	.25	35	2.06	40

Table 2. Mutual Fund Size and Performance Correlation Coefficients

	Correlation Coefficient	Probability Correlation = 0
Correlation of Geometric Mean and Size	.311	.048
Correlation of Sharpe Index and Size	.270	.088
Correlation of Treynor Index and Size	.142	.375

Conclusions

Large mutual funds perform about the same as small mutual funds on a risk-adjusted basis. There is an appearance of large fund superiority when unadjusted returns are examined, but this superiority mostly disappears when we adjust for risk. These results reaffirm the importance of considering risk differences when measuring portfolio performance. If forced to choose between a large fund and a small one, with no other information to go by, I would probably choose the large one.

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Illinois Business Indexes

The composite leading indicator continues to project growth in the Illinois economy over the next several quarters. In April, the current indicator briefly declined below the trend indicator but rebounded by May (see Chart 1), suggesting that the decline represents a fluctuation around the general upward trend rather than a change in the trend itself.

Although real weekly earnings in the manufacturing sector remained almost constant at $400 over the past two years (see Chart 2), growth in the Illinois economy is reflected by the recent improvement in real retail sales as illustrated in Chart 3. Since January 1988, monthly sales have generally increased over the previous year's amounts.

The help wanted indexes used to construct Chart 4 measure the volume of classified advertising in the respective cities' major newspapers, and are sensitive to changes in the demand for labor and general business conditions. Although the Chicago help wanted advertising index is absolutely higher than the St. Louis index, Chart 4 indicates that the two indexes follow the same general trend. The Chicago index fell by .87 percent in May while the St. Louis index increased by 5.63 percent.

As expected, residential housing permits were lower in the winter months during the past two years due to seasonal patterns (see Chart 5). Despite growth in housing permits during the spring months, however, the current year is showing a weak performance relative to the previous year. Chart 6 shows that area inflation rates have held steady at approximately three to four percent during 1988. Chicago's rate of inflation fell throughout March, April, and May of this year, and the May rate of 3.29 percent was lower than that of the North Central United States (3.94 percent).

ILLINOIS BUSINESS INDEXES

	Percent Change May 1987- May 1988	May 1988	April 1988	March 1988	Feb 1988	May 1987	April 1987
Leading Indicator (Current Indicator)	2.65[a]	13.32	12.50	12.99	13.57	10.67	12.13
Leading Indicator (Trend Indicator)	0.75[a]	13.25	13.08	12.24	11.48	12.50	13.27
Employment-manufacturing (in thousands)[b]	1.81%	943.9	944.4	942.2	938.0	927.1	926.6
Average weekly hours-manufacturing[b]	0.48%	41.6	41.8	41.8	41.9	41.4	41.2
Weekly earnings-manufacturing[b]	2.34%	$460.10	$463.14	$462.31	$463.41	$449.60	$447.43
Help wanted advertising-Chicago (1967 = 100)[c]	2.70%	114	115	116	116	111	105
Help wanted advertising-St. Louis (1967 = 100)[c]	19.05%	75	71	67	69	63	63
Retail sales (in millions)[d]	14.75%	$6,627	$6,135	$6,175	$5,234	$5,775	$6,082
Coal production (in thousands of tons)	8.66%	5,068	4,624	5,200	4,873	4,664	5,457
Petroleum products (in thousands of barrels)[b]	−1.00%	1,980	1,985	2,000	1,990	2,000	2,000
Vendor performance[e]	10.00%	66%	62%	69%	66%	60%	57%
Building permits (in thousands)							
Residential housing units	−9.09%	4,632	4,112	3,208	1,388	5,095	4,624
Value of residential housing	6.24%	$384,122	$346,092	$341,112	$161,368	$361,550	$384,791
Value of nonresidential construction							
Industrial buildings	7.40%	$30,585	$16,511	$13,414	$17,734	$28,477	$37,927
Office, banks, and professional buildings	62.76%	$65,638	$28,256	$91,781	$124,263	$40,327	$46,810
Stores and other mercantile buildings	15.87%	$47,211	$33,886	$37,818	$28,496	$40,746	$26,679
Other	104.00%	$11,589	$5,127	$5,003	$1,565	$5,681	$5,661
Consumer price index (1982-84 = 100)							
North Central US	3.94%	115.5	114.9	114.3	113.7	111.1	110.9
North Central: population more than 1,200,000	3.81%	116.0	115.7	115.1	114.7	111.7	111.4
North Central: population 360,000 to 1,200,000	4.18%	115.7	115.0	114.2	113.5	111.1	111.1
North Central: population 50,000 to 360,000	4.50%	116.1	115.2	114.6	113.4	111.1	110.6
North Central: population less than 50,000	2.85%	112.2	111.8	111.1	110.5	109.1	108.9
Chicago	3.29%	117.0	117.1	116.9	116.6	113.3	112.8
St. Louis	2.54%	114.1	—	114.2	—	111.3	—
		1987 IV	1987 III	1987 II	1987 I	1986 IV	1986:III
Personal income (in millions)[b,f,g]	7.81%	$196,097	$189,115	$186,231	$185,885	$181,893	$180,127
Per capita personal income[b,f,g]	7.50%	$16,886	$16,297	$16,060	$16,041	$15,708	$15,566

[a]Represents absolute change (percent change not relevant). [b]Recent month is preliminary figure. [c]The Conference Board, *Help Wanted Advertising*, May 1988; seasonally adjusted. [d]Latest month projected by BEBR. [e]Percentage of companies receiving slower deliveries. [f]Seasonally adjusted at annual rates. [g]Percent change between 1986 IV and 1987 IV.

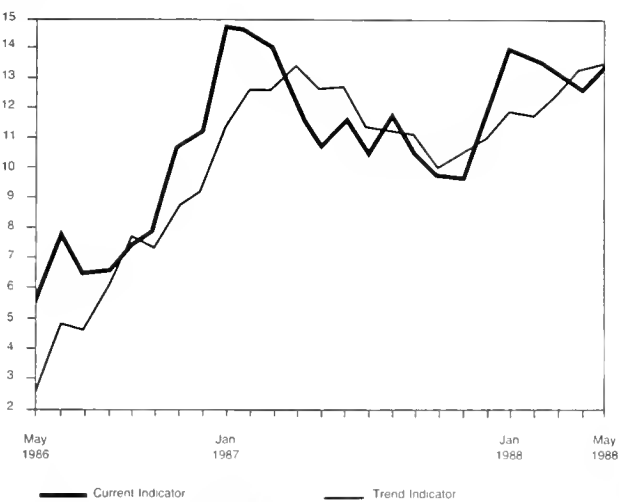**Chart 1. Composite Leading Indicators** (*average percent change in base indexes*)

May 1986   Jan 1987   Jan 1988   May 1988

— Current Indicator   — Trend Indicator

Chart 2. Real Weekly Earnings—Manufacturing

JUN 86-MAY 87
JUN 87-MAY 88

86 87 JUN   86 87 87 88 DEC JAN   87 88 MAY

Chart 3. Real Retail Sales (*in millions*)

JUN 86-MAY 87
JUN 87 MAY 88

86 87 JUN   86 87 87 88 DEC JAN   87 88 MAY (Est.)

Chart 4. Help Wanted Advertising Indexes (*percent change from previous month, seasonally adjusted*)

— ST LOUIS
★★★ CHICAGO

MAY 87   DEC 87   MAY 88
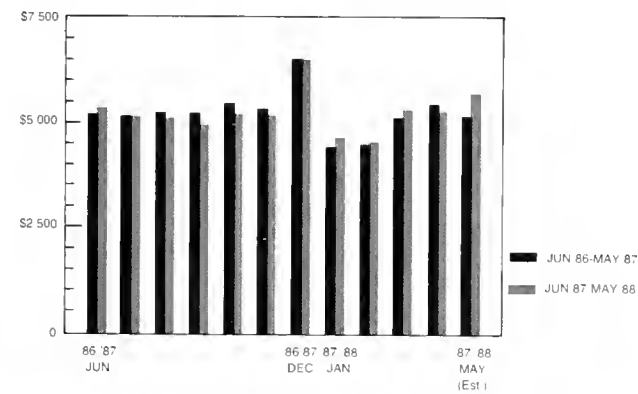
Chart 5. Residential Housing Units (*in thousands*)

JUN 86-MAY 87
JUN 87 MAY 88

86 87 JUN   86 87 87 88 DEC JAN   87 88 MAY

Chart 6. Year-to-Year Change in Selected CPI

NORTH CENTRAL
CHICAGO

DEC 87   MAY 88

15
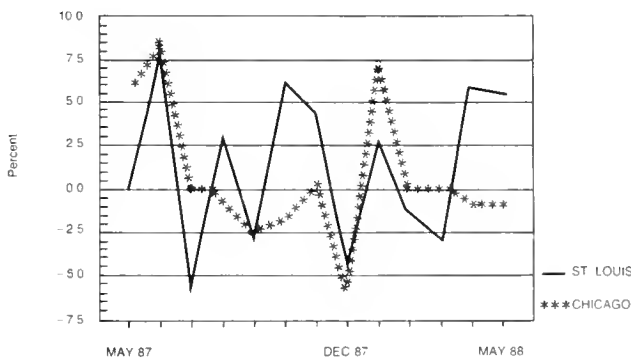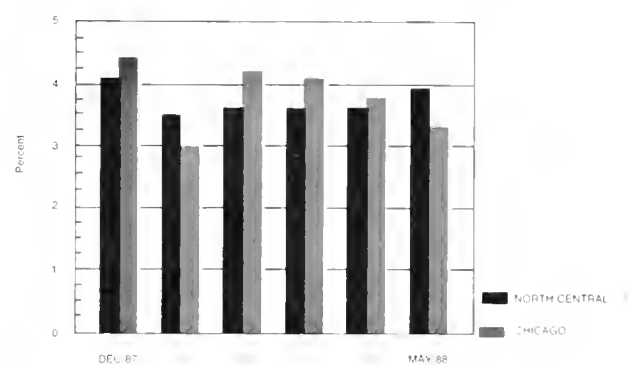
Illinois Business Review

Bureau of Economic and Business Research

428 Commerce West, 1206 South Sixth Street

Champaign, Illinois 61820

Illinois Economic Outlook

The Illinois Econometric Model forecasts slow growth in employment through the first quarter of 1989. With the exception of mining, each sector of the state's economy is expected to show increased employment levels in 1988. The chart compares job growth in Illinois with the expected performance of the US economy. The rate of growth in Illinois fell below the national level in the fourth quarter of 1987 and is expected to remain significantly below this level for the foreseeable future.

The table presents more detailed forecasts of employment levels in several major sectors of the Illinois economy. While mining, construction, and manufacturing are expected to contribute very little to job growth in the state, the remaining sectors are expected to have a significant impact. The increasing importance of the financial, trade, and service industries illustrates the changing structure of both the Illinois and US economies.

Illinois Employment Growth (*percentage change from previous quarter*)
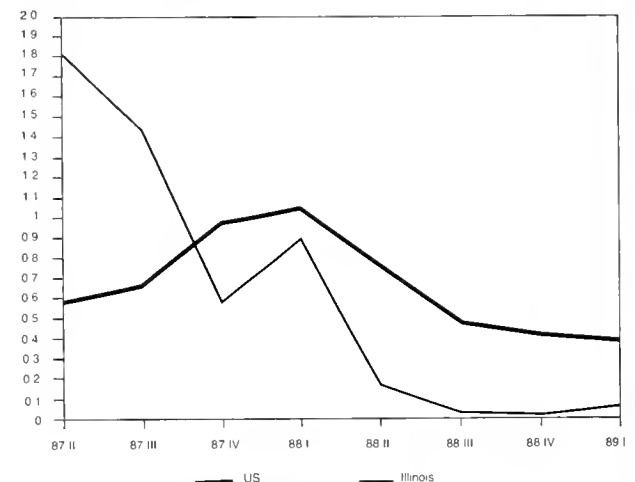
Illinois Seasonally Adjusted Employment

	History				Forecast			
	87:II	87:III	87:IV	88:I	88:II	88:III	88:IV	89:I
Total private nonfarm (thousands)	4,128.4	4,187.9	4,212.3	4,250.0	4,257.1	4,258.7	4,259.6	4,262.5
Mining	24.4	24.4	24.0	24.1	23.9	23.6	23.2	22.8
Construction	175.1	178.2	186.8	202.8	198.8	192.5	186.7	182.1
Manufacturing	926.0	930.4	936.5	941.5	936.5	931.7	926.0	920.8
Durable manufacturing	562.4	566.3	569.5	571.4	567.3	563.7	559.7	555.9
Primary metals	55.5	56.0	55.6	54.5	54.6	55.4	55.1	55.5
Fabricated metals	110.9	111.8	110.9	108.9	109.8	109.5	109.4	109.3
Nonelectrical machinery	138.7	139.5	139.4	137.6	138.3	138.3	138.2	138.2
Electrical machinery	117.7	117.7	120.2	122.0	118.6	116.9	114.7	112.7
Miscellaneous durables	139.5	141.3	143.2	149.1	146.1	143.7	142.3	140.2
Nondurable manufacturing	363.7	363.6	367.0	370.1	369.2	368.0	366.3	364.9
Food products	91.7	90.9	91.4	91.2	91.3	91.0	90.8	90.5
Printing and publishing	106.8	106.6	107.1	108.8	109.1	109.0	108.5	107.9
Chemicals	56.9	57.1	57.4	57.8	58.2	58.3	58.5	58.7
Miscellaneous nondurables	108.8	109.2	110.1	111.4	110.5	109.7	108.5	107.8
Utilities and transportation	282.7	284.1	291.4	300.7	295.3	289.9	285.6	282.0
Wholesale and retail trade	1,222.0	1,236.5	1,234.2	1,243.7	1,254.1	1,262.6	1,270.5	1,277.8
Finance, insurance, and real estate	352.2	354.3	357.5	363.7	366.3	367.1	367.4	367.7
Services	1,143.5	1,147.7	1,163.3	1,173.6	1,182.3	1,191.2	1,200.1	1,209.3

Illinois Business

view

Clarification

By error, the numbers indicating the regions were left
off the accompanying map as it was published in the
article, "State and Regional Economic Impact of
Diamond-Star Motors," by Harrison S. Campbell, Jr. in
the August issue of the *Illinois Business Review.* We
reprint the map here with the appropriate region
numbers. We apologize for any inconvenience caused
to the author and readers.

Illinois's Seven Commuting Regions

WILLIAM R. BRYAN AND CHARLES M. LINKE
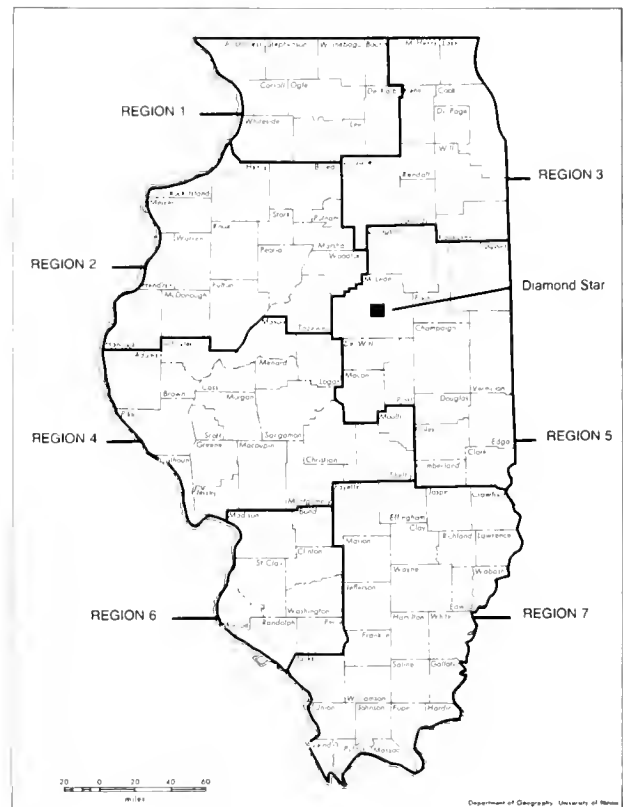
Value of a College Education

Colleges and universities throughout the nation have announced tuition increases for the coming year. These increases continue a trend that has characterized the past several decades, and longer. In part, increases in the cost of higher education are an aspect of generalized inflation. Beyond that, however, there have been increases in the relative price of higher education.

In understanding why it is that we are willing to make the major expenditures associated with education and in accounting for some of the reasons that relative costs continue to increase, it is useful to review some of the returns to education. One way of thinking about returns is to identify the gains to society that accrue by virtue of advances associated with education in general or higher education in particular. An alternative way of thinking about the returns to education, the approach taken here, is to concentrate on the gains to the individual. In this article, we identify the extent to which an individual's earnings are enhanced by the education process, or factors associated with that process.

A person with four years of college earned in excess of $11,000 more per year in 1988, on average, than one whose formal education stopped with high school. Over an entire work life the average earnings of a college graduate are substantially in excess of those of a high school graduate.

Education is not the only determinant of earnings. Other important general factors include age, race and sex, occupation, considered individually and in combination. Moreover, data presented here cannot really show that the increased earnings result from a college education, rather than from some other set of factors. The fact that a person has completed college and enjoys high earnings may be a reflection of a host of other considerations—family income, race, personal intelligence and energy, motivation, social status, political power, and so forth.

Data

The earnings data are from *Money Income of Households, Families, and Persons in the United States: 1985*, a 1987 publication of the Bureau of the Census. We give the 1985 data in 1988 dollars by an adjustment formed from the 1985 to 1988 change in the level of consumer prices. The data are limited to earnings, that is, money received for performing work, either as an employee or self-employed.

Data relating to the length of work life are from *Work Life Estimates: Effects of Race and Education*, a 1986 publication of the Bureau of Labor Statistics. An individual's work life consists of the period during which there is participation in the work force. Accordingly, a work life is the sum of periods of time an individual is employed and periods unemployed.

Age-Earnings Life Cycle

Money earnings of workers in general have shown persistent increases over the past half century. In part, the increases have been an aspect of inflation. The earnings statistics discussed here are presented in 1988 dollars, thereby removing the effects of general inflation. Other important sources of gains in earnings include productivity gains—that is, increased output reflecting improvements in technology and other factors. Over the past three decades, increases in real earnings of year-round workers have averaged just under 1.5 percent per annum.

If we shift our focus from workers in general toward the earnings of individuals, there are changes associated with movement through the life cycle. It is generally the case that an individual's real earnings tend to rise over an extended portion of life, then drift lower as he or she nears retirement. The life-cycle pattern is illustrated in Chart 1. The line moving toward the top of the chart shows a college graduate's life cycle of real income assuming an annual increase in productivity of 1.5 percent spread evenly across age categories. The center line depicts the present value of real income across age categories. For a discussion of present value see the accompanying inset. In that discussion we reach the conclusion that factors affecting the growth in earnings are approximately offset by factors affecting the appropriate discount rate. Hence, the present value of an individual's life cycle of earnings is approximated by the sum of constant dollar earnings over the life cycle.

The Concept of Present Value

Choice is one of the most pervasive of human activities. Some of the most difficult, yet common, decision-making involves choice among unlike objects, events, or activities. Other decisions relate to similar, even identical, objects, events, or activities, but involve choice along a time dimension. Shall we do it now? Or shall we do it later? Time emerges as an important economic variable by virtue of the human condition that something received now is inherently more desirable than something to be received later. That human condition probably relates to the fact that each of us ages and, at length, dies. Hence, time is finite to the individual. If an individual forgoes something now, he may never again have the opportunity to experience it.

To compare unlike flows of benefits (or, alternatively, of costs), economists employ the concept of present value. Occasions arise when it is important to compare the desirability of receiving one amount of money now, say $1,000, with the desirability of receiving an alternative amount, say $2,500, at some specified time in the future. Or, we may need to compare the value of the receipt of $1,000 now with the value of receiving a monthly amount of, say, $25 spread over a specified number of months. It is that type of problem that is posed in evaluating a college education. The differentials in earnings between college graduates and high school graduates are spread over a lifetime. In determining whether the expenses of college are worthwhile, it is necessary to determine how much that differential is worth.

The dominant approach to thinking about the meaning of present value is to pose the following question: What amount, if invested today, would exactly produce the future year-by-year series of payments? In the matter at hand, we are interested in knowing how much would need to be invested to make up for the earnings difference between a high school graduate, variously defined, and a college graduate.

The answer to this present value question depends upon four factors. One ingredient to an answer involves knowing the size of the initial earnings differential between the college graduate and the high school graduate; a second ingredient involves identifying the rate (or rates) of growth in that differential; a third factor involves identifying the discount rate, the yield that would accrue to the invested principal; and the final ingredient involves determining the length of the period over which the differentials are to be experienced.

For the matter at hand, it is probably sufficient to assume that the growth rate in earnings and the rate of return on the principal investment are approximately equal. For a discussion see W. R. Bryan and C. M. Linke, "Estimating the Present Value of a Future Earnings Stream: Some Evidence from Experience with Dedicated Portfolios," *Journal of Risk and Insurance* (June 1988).

Chart 1 also shows present value data for high school graduates. Two points are noteworthy. First, the life cycle of annual real earnings for college graduates is markedly higher than for high school graduates. Second, the growth of earnings persists longer for college graduates than for high school graduates.

Chart 1. Life Cycle of Earnings *(Year-Round Workers, Males and Females, 1988 Dollars)*

Annual Earnings (Thousands)

Years of Age
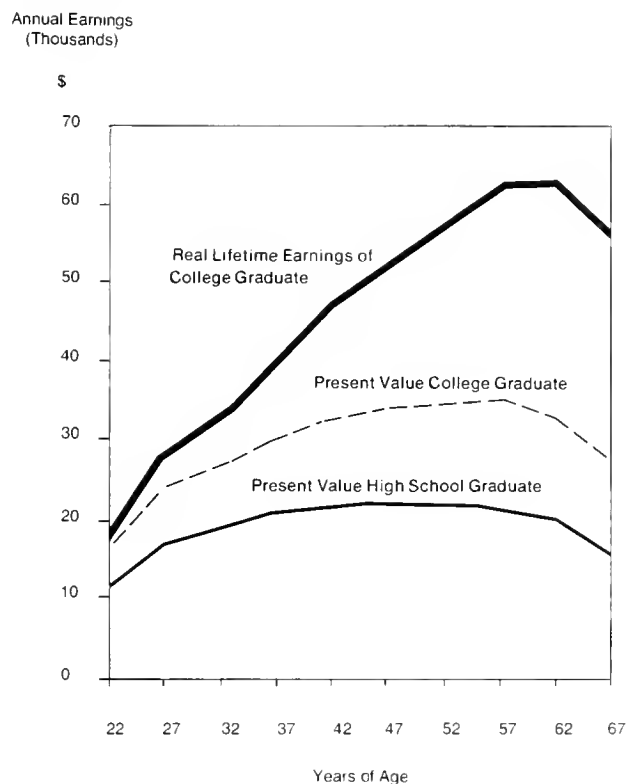
Lifetime Earnings

The college graduate works to an older age, on average, than does a high school graduate. A male college graduate who enters the work force at age 22 has a work life expectancy of 37.1 years, implying work to age 59.1. In contrast, a high school graduate entering the work force at age 18 has a work life expectancy of 37.9 years, or to age 55.9.

The work life of females, on average, is substantially shorter than that of males. For a variety of reasons, women are apparently more likely than men to withdraw from the work force for extended periods of time. For example, a female may withdraw from the labor force in order to raise a family. But work life expectancies are derived from cross-sectional data. Thus, the expected work life for females cannot fully reflect the significant changes that have occurred during the past two decades in the roles of women in the labor force.

Factors associated with a college education tend to lengthen a female's expected work life. A female high school graduate entering the work force at age 18 has an expected work life of 27.9 years, or an average work life extending to age 45.9. By comparison, a female college graduate entering the work force at age 22 has a work life expectancy of 28.6 years, implying work until 50.6. As a consequence of the differences in timing of work life patterns, the lifetime earnings of college graduates in general, and female graduates in particular, are further enhanced.

Having set forth data relating to earnings and work life, we are in a position to discuss lifetime earnings. For illustrative purposes, suppose that the average work life is 32.9 years for both an 18-year old high school graduate and a 22-year old college graduate. With this assumption, average lifetime earnings in 1988 dollars for a high school graduate are $596,944 (see Table 1). Average lifetime earnings for a college graduate are $965,633, 61.8 percent greater than for a high school graduate.

Table 1. Lifetime Earnings of High School and College Graduates *(Males and Females Combined, Present Values in 1988 Dollars)*[a]

Annual Age Categories	Earnings	Work Life	Lifetime Earnings
	High School Graduates		
18-24 years	$11,181	7.0	$ 78,267
25-29 "	16,950	5.0	84,750
30-34 "	18,715	5.0	93,575
35-39 "	20,657	5.0	103,285
40-44 "	21,443	5.0	107,215
45-49 "	22,058	5.0	110,290
50-54 "	21,735	0.9	19,562
55-59 "	21,420	0.0	—
60-64 "	20,065	0.0	—
65 and over	15,310	0.0	—
		32.9	$596,944
	College Graduates		
18-24 years	$16,208	3.0	$ 48,624
25-29 "	24,269	5.0	121,345
30-34 "	27,012	5.0	135,060
35-39 "	30,615	5.0	153,075
40-44 "	33,006	5.0	165,030
45-49 "	34,336	5.0	171,680
50-54 "	34,861	4.9	170,819
55-59 "	35,255	0.0	—
60-64 "	32,992	0.0	—
65 and over	27,567	0.0	—
		32.9	$965,633

[a]Differences in earnings levels across age categories primarily arise from skill, experience and seniority differences among workers in the respective categories. The figures implicitly reflect present values. The earnings gains that might be expected to accrue over time from general productivity increases, not allowed for in the figures, are approximately offset by the discount rate that would otherwise be applied in the determination of present value.

What factors account for the differential between the earnings of college graduates and high school graduates? Most traditional professions, as well as executive and managerial occupations, require a college education. These occupations typically involve high earnings. In

addition, it is frequently the case that such occupations are not physically demanding. Hence, youth may not be an important advantage. Indeed, youth may be a disadvantage. Thus, within these occupations an individual can look forward to a relatively long work life with undiminished earnings.

Because professionals, executives, and managers are substantially insulated from the business cycle, a college graduate may be employed for virtually the entire work life. It is not unusual to encounter professionals who have never experienced unemployment. The data are consistent with this generalization. The sample data include 45,094 men and women who had less than a high school education. Of this group, only 53.6 percent worked year-round or full time. The sample included 49,674 who were high school graduates; among these, 59.1 percent were year-round workers. Finally, the sample included 25,883 who had attended four or more years of college. Nearly three-quarters of this group worked year-round.

Focusing on those working year-round, the incremental value of a college education is even more dramatic. For a male, life-time earnings rise $669,229 (from $819,720 to $1,488,949) as education increases from high school (Table 2) to college (Table 3), a gain of 81.6 percent. For a female, lifetime earnings rise $378,167 (from $303,520 to $681,687) as education increases from high school (Table 2) to college (Table 3), an improvement of 124.6 percent.

Another major factor associated with earnings relates to the gender of the individual. Chart 2 shows the life-cycle pattern of earnings of male and female college graduates who worked year-round. The dominant impression emerging from Chart 2 is that annual earnings of male college graduates are substantially greater than those of females. Not evident from Chart 2, but as discussed earlier and taken into account in Table 3, the expected work life of a male is substantially longer than that of a female.

In view of the higher annual earnings and the longer work life, on average, a male college graduate working year-round will earn $807,262 more than a female. A male can expect lifetime earnings of $1,488,949 in 1988

Table 2. Lifetime Earnings of High School Graduates
(Year-Round Full-Time Workers, Present Values in 1988 Dollars)[a]

| Annual Age Categories	Earnings	Work Life	Lifetime Earnings
Male High School Graduates			
18-24 years	$10,271	7.0	$ 71,897
25-29 "	18,883	5.0	94,415
30-34 "	21,099	5.0	105,495
35-39 "	24,522	5.0	122,610
40-44 "	26,519	5.0	132,595
45-49 "	27,821	5.0	136,930
50-54 "	26,386	5.0	131,930
55-59 "	26,498	0.9	23,848
		37.9	819,720
Female High School Graduates			
18-24 years	$ 7,014	7.0	$ 49,098
25-29 "	11,130	5.0	55,650
30-34 "	12,325	5.0	61,625
35-39 "	12,507	5.0	62,535
40-44 "	12,601	5.0	63,005
45-49 "	12,897	0.9	11,607
		27.9	$303,520

[a]See note to Table 1

Table 3. Lifetime Earnings of College Graduates
(Year-Round Full-Time Workers, Present Values in 1988 Dollars)[a]

Age Categories	Annual Earnings	Work Life	Lifetime Earnings
Male College Graduates			
18-24 years	$20,318	3.0	$ 60,954
25-29 "	29,533	5.0	147,665
30-34 "	33,673	5.0	168,365
35-39 "	39,580	5.0	197,900
40-44 "	45,355	5.0	226,775
45-49 "	48,194	5.0	240,970
50-54 "	49,476	5.0	247,380
55-59 "	48,522	4.1	198,940
		37.1	$1,488,949
Female College Graduates			
18-24 years	$18,264	3.0	$ 54,792
25-29 "	22,223	5.0	111,115
30-34 "	24,388	5.0	121,940
35-39 "	24,833	5.0	124,165
40-44 "	24,942	5.0	124,710
45-49 "	24,564	5.0	122,820
50-54 "	24,605	0.9	22,145
		28.9	$681,687

[a]See note to Table 1

Chart 2. Life Cycle of Earnings of College Graduates
(Value in 1988 Dollars)
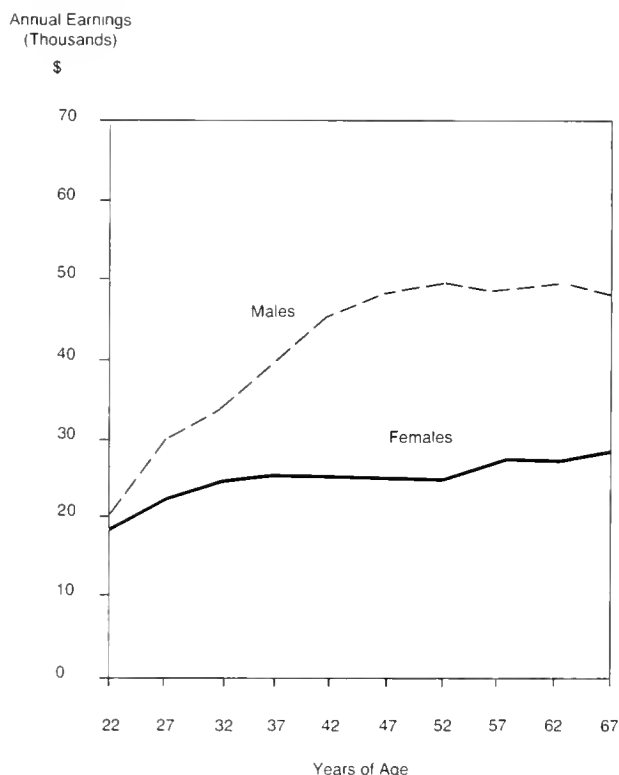
dollars. A female college graduate can expect average lifetime earnings of $681,687, less than one-half the lifetime earnings of a male college graduate (see Table 3). If the female's expected work life were the same as a male's, lifetime earnings would reach $894,448, still only about two-thirds the earnings of a comparably educated male.

Concluding Remarks

Notwithstanding the increased out-of-pocket costs associated with attending college, it is reasonably clear that costs fall far short of the future benefits. The present values of the increased earnings associated with graduation from college are substantial. Even if one were to include the earnings foregone while attending college, about $50,000 for a male high school graduate and $30,000 for a female high school graduate, the returns from a college education are well in excess of the costs.

Beyond that, it can be argued that college involves nonpecuniary returns. For many students, life on campus is an immensely pleasurable social experience. Moveover, many people are able to continue aspects of their campus experience throughout the remainder of their lives. Those who attend college may reap other nonpecuniary benefits from their education. In subtle ways, they may move toward insights and skills that improve their ability to interpret the world in which they live. Ideally, an education can contribute to an individual's ability to grow in many dimensions of life.

William R. Bryan and Charles M. Linke are both professors of finance at the University of Illinois at Urbana-Champaign. Professor Bryan is also the department chairman and the editor of the Illinois Business Review.

MARVIN FRANKEL

The Impact of Aircraft Noise on Residential Property Markets

Among the environmental problems receiving increasing attention over the past 15 to 20 years is that of aircraft noise. In Illinois, concern over this issue led in 1977 to a proposal by the Attorney General to the Pollution Control Board for the regulation of noise emissions from the state's public airports. Although the proposal affected a number of airports in some degree, its main thrust was toward the two Chicago airports, O'Hare and Midway, both of which are sited in or near densely populated areas. A large number of public hearings, stretching over several years, were held on the proposed regulation. But ultimately in 1987, following litigation and a court decision that suggested federal preemption in this policy area, the Board suspended its consideration of the matter, and the proposed regulation is now dormant or dead. Meanwhile, expressions of organized concern continue, mainly from groups in the suburban O'Hare area, with remedies sought through the legislature and the courts.

An interesting and important question with regard to any environmental disamenity is, how great a burden does it impose on the affected parties? Both urban economists and home buyers have long recognized that certain neighborhood characteristics such as good (poor) schools, proximity to (remoteness from) shopping facilities, good (poor) municipal services, and quiet (noisy) surroundings tend to be capitalized into residential property values. Thus, a home in a quiet neighborhood with good schools will be worth more than a similar home in a neighborhood lacking those attributes. This circumstance has been utilized by researchers in studies that seek to place a monetary value upon particular amenities and disamenities. In the case of aircraft noise, studies that utilize multiple regression techniques to estimate how residential property values are affected by different noise levels have been conducted at a number of airports in this country and abroad—though not at any Illinois airports. The present study takes a different approach, relying upon the survey method to determine the impact of aircraft noise upon property markets. Subjects of the study are two groups, Realtors® and appraisers, generally recognized to be specialists experienced in and knowledgeable about real estate markets and property values. The respondents were asked about certain characteristics of markets for noisy properties and about the behavior of buyers and sellers in those markets. They were also asked to provide estimates of

the effects on property values of various levels of aircraft noise. The survey explored other issues as well, but space does not allow for a discussion of them in this article.[1]

The populations of Realtors® and appraisers surveyed are located in some 40 suburban communities surrounding O'Hare Airport. In the sample drawn for each of the two groups, greater emphasis was given to individuals located in the 20 communities closest to the airport. All of the communities within or astride the 65 Ldn contour[2]—the noise level recognized by the Federal Aviation Administration as a threshold at which significant burdens arise for the residential environment—and many communities proximate to but outside it, were covered in the survey. Completed questionnaires were received from 200 Realtors® and 70 appraisers, representing a response rate for each group of about 50 percent. The total populations of these groups is not fully known. The Realtor®'s sample was drawn from a membership list of the Illinois Association of Realtors® containing in excess of 5,000 names. The appraiser sample was drawn from the consolidated lists of seven appraiser organizations—all that the author could identify—containing a total of approximately 140 names.

Both respondent groups report considerable experience in their respective activities. Median years of practice for Realtors® is 8, while the corresponding figure for appraisers is 10. A significant fraction of each group, but particularly the appraisers, report experience in both brokerage and appraising. Most of the Realtors®—85 percent—and over two-thirds of the appraisers practice their specialty at least 30 hours a week. Real estate activities appear to bring substantially more frequent contact with noisy properties than do appraisal activities. However, the actual difference between Realtors® and appraisers in this regard may be more modest, since half the appraisers also have experience as Realtors® and, through that activity, presumably have gained fuller exposure to properties affected by noise.

The Relative Importance of Factors Affecting Property Values

Notwithstanding the distinctive and disturbing impact that aircraft noise can have on those regularly subject to it, it is but one of a number of factors influencing residential property values in the suburban O'Hare area. How important is its influence as compared to various other location-related variables? Appraiser respondents were asked to rate on a four-point scale—large (1), moderate (2), small (3), and negligible (4)—and the influence of each of a dozen factors on the property value of a "typical" single-family dwelling located within a seven- or eight-mile radius of the airport. The area within this boundary is blanketed by irregularly shaped noise contours ranging from 80 Ldn close to the airport down to 60–65 Ldn and below at the outer edges. Virtually all of the communities within this area are sources of complaints by residents to the O'Hare Noise Abatement Office, though the number of complaints from some of the more distant communities is small.

The results are summarized in Table 1, which ranks the several factors from most important to least important. Two numbers are shown by each factor. The first gives the mean score on the four-point scale, while the second shows the percent of respondents scoring a factor as having small or negligible importance. Differences in mean scores of less than 0.10–0.15 are not significant. Quality of neighborhood, proximity to schools, and amount of property taxes are ranked at the top of the list in importance. Somewhat surprisingly, moderate aircraft noise ranks relatively low on the list, in ninth place, below traffic noise. The mean score of 2.13 for aircraft noise indicates an influence slightly below moderate, and 30 percent of respondents regarded this factor's importance as negligible or small. The low rank might possibly be explained by the widespread presence in the survey area of moderate noise levels, with a consequent tendency to downplay this factor in a comparative assessment. Presumably, a noise level described as substantial or severe would have been accorded a higher ranking.

Table 1. Importance of Factors Affecting Residential Property Values *(in rank order)*

	Mean Score[a]	Percent of Respondents Indicating Small or Negligible Importance
1. Quality of other dwellings in neighborhood	1.23	1.4
2. Proximity to schools	1.74	11.4
3. Amount of property taxes	1.78	11.6
4. Proximity to shopping facilities	1.97	14.4
5. Access to main roads	1.97	18.8
6. Quality of municipal services	1.99	20.2
7. Trees, shrubs, parks in neighborhood	2.00	21.7
8. Presence of moderate traffic noise	2.06	23.1
9. Presence of moderate aircraft noise	2.13	30.4
10. Proximity to medical services	2.55	52.2
11. Proximity to jobs at airport and in related activities	2.67	58.8
12. Access to the airport	2.85	69.5

[a]The scale is 1 (large), 2 (moderate), 3 (small), and 4 (negligible).

The lowest-ranked of the characteristics in Table 1 are proximity to jobs in airport-related activities and access to the airport itself. This suggests that homeowners do not see substantial advantages in near-airport locations or that any such advantages are overshadowed by other kinds of location-related characteristics.

The Market for Noise-Affected Properties

The State of Buyer Information

Residential real estate markets, while they lack some of the features of perfectly competitive markets, probably would be thought of as reasonably efficient. At the same time, and on the limiting side, these markets are often characterized by imperfect information, fewness of participants, highly

differentiated product and variable product quality, unrealistic expectations of buyers and sellers, and adjustment lags. But most of us might agree that when transactions take place, buyers and sellers are, on the whole, reasonably well matched and that prices settle within a plausible range.

Does the presence of aircraft noise, through its effects on the information needs and the attitudes of buyers and sellers, inject novel or distorting elements into this market process? A few of the survey questions bear on this issue. One such equation, put to both Realtors⁰⁰ and appraisers, asked the following:

> Consider a homebuyer who agrees to purchase a dwelling in an area significantly affected by aircraft noise. From your experience, how well-informed would you say such a homebuyer is about the noise environment of the property?

The question is important because, among other reasons, a knowledgeable buyer engaged in a voluntary transaction may be presumed to be compensated through a lower purchase price for any negative attributes that the property may possess.

The answers to the question, summarized in Table 2, show a diversity of views. Two-thirds of the Realtors® and almost half of the appraisers considered buyers to be either moderately or very well informed. At the same time, while few respondents regarded buyers as simply uninformed, one-third of the Realtors® and the other half of the appraiser group thought of them as being, at best, not very well informed. The results suggest that, judged by the experience of many Realtors® and appraisers, a significant segment of buyers lacks adequate information about the noise environment. Accordingly, their bid prices for properties will tend to be too high, and their expectations for the amenity levels of their dwellings will, following purchase, tend to be disappointed.

Table 2. How Well Informed Are the Buyers of Noise-Impacted Properties? *(Figures show percent of respondents choosing each response category.)*

Responses	Realtors®	Appraisers
Very well informed	22.2%	7.3%
Moderately well informed	43.7%	41.8%
Not very well informed	30.5%	45.4%
Uninformed	3.6%	5.4%

Aircraft noise is not unique as a factor about which buyers have imperfect knowledge. Residential dwellings are complex products and home buyers will sometimes lack sufficient information on certain of their attributes. Hence, they will encounter disappointments over faulty plumbing, leaky roofs, or quality of schools. But faulty plumbing and leaky roofs are sporadic events, and school quality may turn out to be better, about as often as it turns out to be worse, than expected. Aircraft noise, on the other hand,

blankets whole neighborhoods, and it typically carries unfavorable surprise for the uninformed. More important, it would not seem difficult to improve the state of information on this location attribute.

Other Characteristics of the Market for Noise-Affected Properties

Three questions were asked of Realtors® concerning the behavior of sellers and buyers toward noise-affected residential properties and, implicitly, the pressures on the demand and supply sides that might result. The questions and the responses are summarized in Table 2. As in other questions, a considerable diversity of experience among respondents is indicated.

Only about 9 percent of Realtor® respondents thought it a frequent occurrence for sellers to put their homes on the market wholly or primarily because of disturbance from aircraft noise. But some 47 percent of respondents judged that this occurred at least occasionally, suggesting a higher incidence of dissatisfaction by the occupants of noisy residences and the possibility of a higher turnover rate for those properties. Interestingly, such seller behavior was, at most, a rare occurrence for over 50 percent of the respondents. In the second of the three questions, Realtor® experience indicates a fairly common concern by buyers to avoid dwellings subject to aircraft noise. Some 49 percent of respondents reported encountering this concern frequently, and a further 42 percent reported encountering it occasionally. These results point to a thinner market on the buying side for noisy properties and, taken together with the results of the preceding question, indicate a generally weaker market for that category of residential real estate.

A third question, shown also in Table 2, asked about the frequency with which buyers used the noise factor as a bargaining chip in negotiations with sellers. Some 17 percent of Realtor®-respondents found this to occur frequently, and an additional 42 percent reported it as occurring occasionally. Those who thought it rarely or never happened were in a minority. These responses, along with those to the preceding question, indicate that many buyers are quite aware of the noise problem and give it explicit consideration in their purchase-price calculations. The responses confirm also what economists have long thought to be the case: home buyers are quite prepared to be compensated through a lower purchase price for a property-affecting disamenity such as aircraft noise. The responses further give evidence of the downward pressure on residential property prices that the noise disamenity generates.

A fourth question (not shown in Table 3) asked specifically about property turnover:

> Of the residential areas you are familiar with that are exposed to significant amounts of aircraft noise, would you say that the turnover of properties is . . .
> Much below average, ... 1.3% (1.8%)
> Below average, ... 20.5% (14.0%)
> About average, ... 53.8% (68.4%)
> Above average, or 19.9% (15.8%)
> Much above average? 4.5%

Table 3. Buyer and Seller Behavior toward Noise-Affected Properties *(Figures show percent of respondents choosing each answer category)*[a]

Question	Never	Rarely	Occasionally	Frequently
a. In your experience with the listing or sale of dwellings affected by aircraft noise, how often have the owners indicated they put their homes on the market *wholly or primarily* because of the noise?	25.3% (32.2%)	27.6% (37.3%)	38.2% (25.4%)	8.8% (5.1%)
b. In your experience as a broker, how often have you encountered prospective *home buyers* who indicated a clear desire to avoid dwellings that were subject to aircraft noise?	3.5%	5.2%	42.2%	49.1%
c. In your experience with dwellings affected by aircraft noise, how often have prospective buyers sought a lower-than-listed price specifically because of the noise?	15.3%	25.3%	42.3%	17.1%

[a]Figures in parentheses show responses of appraisers, who also were asked question (a).

The answers show the percentage of respondents choosing each of the alternatives, with the figures in parentheses giving the responses of appraisers. Both distributions are similar and near-symmetrical, with a heavy concentration of responses in the middle. While some respondents indicate above-average turnover for noisy properties, their view is counterbalanced by those judging turnover to be below average. One can marshall arguments for why, a priori, it might be in either direction. But these data rather solidly support the proposition that taken overall, residential property turnover is not affected by aircraft noise.

A final question, asked only of Realtors®, concerned the time required to sell a noise-affected property. The question and responses are shown below:

> Consider the time that elapses from the listing of a residential property to its sale. For properties that are subject to a significant amount of aircraft noise, as compared to similar properties that are relatively free of noise, is this time, on the average . . .
>
> Appreciably greater 22.5%
> Somewhat greater 53.2%
> About the same 20.7%
> Somewhat less, or 3.0%
> Appreciably less? 0.6%

Over 75 percent of Realtor®-respondents indicated that the market required more time to move a noisy property than a quiet one, and 22 percent of them thought an appreciably greater amount of time was needed. This may, at least in part, reflect a thinner market for a noisy property, and it may reflect a tendency by the sellers of noisy properties to set unrealistic initial asking prices (perhaps encouraging buyers to seek price concessions).

Noisy properties are not, of course, unique in requiring longer-than-average times to sell. One might expect that a property that was handicapped in some way, whether through an awkward design feature or a limiting location, would be slower than other properties in attracting buyers.

To summarize, the set of questions and responses discussed in this section point to a market for noise-affected residential properties that has the following characteristics: pressure on the supply side from some homeowners concerned about noise; weakness on the demand side as some prospective buyers avoid noisy properties while others seek price concessions; and sluggishness in moving noisy properties. All of these features militate toward price weakness and price discounts for noise-affected properties.

The Effects of Aircraft Noise on Property Values

Estimates Based on Respondents' General Experience (Survey 1)

Two of the survey questions directly addressed the issue of valuation. The first of these is shown in Table 4, along with the median values of the responses for both Realtors® and appraisers (in parentheses). The underlying data display considerable variation in judgment by respondents. This is well illustrated by responses for the "Moderate" noise category. Just under one-third of the Realtors® thought this noise level would reduce dwelling values by between 1 and 4 percent. But 29.5 percent thought the reduction would be in the 5–10 percent range, and 23.5 percent put it in excess of 10 percent, while 14.8 percent indicated that dwelling values would not decline at all. Whereas 48.9 percent of Realtors® judged that a "Low" noise level would have no effect on property values, 41.0 percent indicated that a "Severe" noise level would cause values to decline by over 25 percent.

Table 4. Effect of Various Aircraft Noise Levels on Residential Property Values *(Survey 1)*

A property's market value can be affected by many factors. In the opinion of some people, a single-family residential property will be reduced in value if, *with all else unchanged*, it is more-or-less regularly subjected to significant amounts of aircraft noise. Based on your professional experience, please indicate in the table below by how much, if at all, *each specified noise level*, occurring on a more-or-less regular basis, reduces a property's market value.

Summary of Responses.

	Median Reduction	
	Realtors[a]	Appraisers
Noise Level		
Low (60–65 Ldn)	1.6%	1.2%
Moderate (65–70 Ldn)	5.5%	3.0%
Substantial (70–75 Ldn)	13.0%	10.0%
Severe (75–80 Ldn)	21.6%	16.5%
Sample Size (n)	199	69

The individual responses are doubtless affected by subjective factors. Respondents may differ somewhat in their interpretations of the noise levels specified in the question; they may err in relating those noise levels to the particular properties they have dealt with; and they may make implicitly faulty comparisons of those properties with the norm of an otherwise equivalent but quiet property. Further, some of the respondents may have limited and atypical experience with noisy properties. Yet one expects—and hopes—that the errors are largely offsetting and that an average of the responses will approximate the underlying value that is sought.

The results of Survey 1 in Table 4 show that for Realtors® the median values range from a low of a 1.6 percent reduction in property value for the low noise category to a high of 21.6 percent for the severe noise category. The corresponding figures for appraisers are 1.2 percent and 16.5 percent. Note that the median estimates for appraisers are consistently below those for Realtors® by 25–45 percent. Because the "Over 25 percent" category is open-ended, arithmetic means of the responses cannot be calculated.

Estimates Based on Neighborhood-Specific Knowledge (Survey 2)

The second, more demanding, question on valuation was posed in the following two steps:

> Please specify in the table below, for each noise category, the names of up to three of the noise-affected areas or locations that you serve. Identify them, if possible, by name of community and geographic sector thereof (e.g., southwest Franklin Park, northwest Arlington Heights, Villa Estates in west Des Plaines). Now enter in the table, for each of the locations you have identified, your estimate(s) of the (average) percent by which, with all else unchanged, the market value of a residential property is diminished by aircraft noise. (If the value is unaffected, enter 0%.)

The table provided entries for three noise categories moderate, substantial, and severe—and as indicated above, up to three entries could be made under each category.

The results of Survey 2, in the form of mean percent reductions in property values, for both Realtors® and appraisers and for single- and multi-family dwellings, are shown in Table 5. There are three noteworthy features of these results. First, the discount percentages for the appraiser group are, like the corresponding percentages in Table 4 (or Survey 1), consistently below those of the Realtor® group. There is no obvious explanation for this outcome, and its rationale remains a source of speculation.

Table 5. Effect of Aircraft Noise Levels on the Values of Single- and Multi-Family Properties *(Survey 2)* *(Figures show the mean percent reductions for each noise category)*[a]

	Noise Level		
	Moderate (65–70 Ldn)	*Substantial (70–75 Ldn)*	*Severe (75–80 Ldn)*
Realtors®			
Single-family	3.9% (0.29)	9.6% (0.47)	16.4% (0.81)
Multi-family	2.6% (0.48)	6.8% (0.60)	12.9% (0.90)
Appraisers			
Single-family	2.7% (0.34)	6.3% (0.57)	12.7% (0.98)
Multi-family	2.0% (0.41)	4.1% (0.62)	9.7% (1.21)

[a]Figures in parentheses are standard errors.

The second feature of note is the consistently lower discounts—25–33 percent lower—assigned by both Realtors® and appraisers to multi-family properties as compared with single-family residences. A plausible explanation for this result is that renters, as mobile and short-term occupants, are less concerned about certain kinds of environmental amenities, or lack thereof, than are homeowners. They know their stay is temporary; they are free to move (within the limits of their leases) if their housing situations do not work out well; and their residency does not entail commitment to an expensive and vulnerable asset. Their bid-rents are, thus, subject to smaller discounts than the bid prices of prospective homeowners, with these differences ultimately reflected in the differential discounts for the two types of properties.

The third point of note involves a comparison of the results of Survey 1 with those of Survey 2. The mean discount values in Survey 2 for single-family residences are consistently below the corresponding median discount values in Survey 1, and this in turn implies, with a possible exception, that they are below the associated (but unknown) mean values that underlie the Survey 1 results. (This can be inferred from the underlying data.) The explanation for this result may lie in the way each of the two sets of questions was put to respondents. In Survey 1, respondents are called upon for general judgments about the magnitude of the noise discount, without regard to specific evidence and particular situations they may have encountered. In Survey 2, they are asked to name communities and neighborhoods and, from their own experience, to supply a discount figure, rather than choosing from a list. It should be mentioned also that respondents for Survey 2 comprise a narrower group than those for Survey 1. Those who dropped out may consist predominantly of individuals who are less experienced and less well informed.

Concluding Note

The juxtaposition of a major airport with large and numerous residential communities generates a classic kind of environmental conflict. On the one hand are the beneficiaries of air travel—the air lines and their passengers—whose rapid and convenient movement is facilitated by the airport. On the other are the property owners located proximate to the airport and subject to the burdens of noisy overflights. Measures to moderate this conflict call for a comparison of the costs of any proposed method of mitigation with the consequent reduction in the burden on affected property owners. Within this context, the estimates of property value discounts presented above are of more than casual interest, for they can be used to indicate the approximate benefit to be gained from a proposed mitigation measure. Thus, a preferential runway procedure or the addition of a new runway that would reduce aircraft noise over a designated residential area from (say) 77–78 Ldn to 72–73 Ldn could be expected (from Table 4) to raise property values, with corresponding benefits to residents, by 6.5 percent (appraisers) to 8.6 percent (Realtors®). Should the airport authority consider the alternative of purchasing avigation easements on a group of affected properties, the data in Tables 4 and 5 might be used in estimating the market worth of those easements.

The impact of aircraft noise on residential areas is a complex phenomenon that affects the behavior of home buyers and sellers and that, in particular situations, is capable of generating intense controversy among the interested parties. It helps to keep the problem in proper perspective by recognizing that, as noted early in this article, noise is but one of many factors affecting housing values, that even where severe, its impact is bounded and approximately measurable, and that its effects often are susceptible to mitigation. However, the more built up is the area around the airport, the more limited will be the opportunities for mitigation. In this respect, O'Hare and Midway airports are difficult cases.

Notes

[1] The full report on the survey is titled, "The Impact of Aircraft Noise and Aircraft Activity on Residential Property Values: A Survey Study." Interested readers may obtain a copy by writing to the Office of Real Estate Research, University of Illinois, 304 David Kinley Hall, 1407 West Gregory Drive, Urbana, Illinois 61801.

[2] Ldn is a measure of the average sound energy emitted over a defined period of time, in this case one year. It includes a penalty weighting for noise emissions during the hours of 10 p.m. to 7 a.m., since they are judged to be more disturbing.

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Illinois Business Indexes

The economic outlook for Illinois continues to show strong improvement. Interpretation of leading indicator data results in a different forecast from the projection of the Illinois Econometric Model (see page 16). As Chart 1 illustrates, the current indicator has been above the trend indicator for most of 1988. This movement in the Composite Leading Indexes points to a continuation of the economic expansion over the next several quarters.

Although state unemployment has remained above the national rate during the past few years, growth in the Illinois economy is reflected by the general uptrend in manufacturing employment (see Chart 2) in the northwestern region and the greater Chicago area. At the same time, retail sales show clear growth during the same period in 1987.

Chart 3 illustrates the help wanted indexes. These numbers measure the volume of classified advertising in major newspapers, and they also show great sensitivity to changes in the demand for labor. In July, Chart 3 indicates that Chicago and St. Louis follow the same general trend. The Chicago index increased by 1.70 percent and the St. Louis index increased by 4.22 percent, reflecting an improvement in general business conditions.

The change in the number of building permits constitutes a good indicator of general economic conditions. Due to seasonal factors, the growth in residential housing permits remains below average during the winter months (see Chart 4). In spring, as expected, the number of new permits grew, but the current year still shows a weak performance as compared with 1987.

Inflationary pressures started to emerge in the US economy and also in its North Central region. Chart 5 shows that inflation has increased in the Chicago area for the past two months, but this increase in the price level has remained markedly below the levels reached in the past year.

ILLINOIS BUSINESS INDEXES

	Percent Change July 1977– July 1988	July 1988	June 1988	May 1988	April 1988	July 1987	June 1987
Leading Indicator (Current Indicator)	4.89[a]	15.27	14.06	13.32	12.5	10.38	11.49
Leading Indicator (Trend Indicator)	2.53[a]	13.72	13.57	13.25	13.08	11.19	12.55
Employment-manufacturing (in thousands)[b]	1.80%	947	949.7	943.9	944.4	930.3	929
Average weekly hours-manufacturing[b]	0.00%	41.6	41.9	41.6	41.8	41.6	41.8
Weekly earnings-manufacturing[b]	2.02%	$462.18	$464.67	$460.10	$463.14	$453.02	$454.78
Help wanted advertising-Chicago (1967 = 100)[c]	-0.83%	119	117	114	115	120	120
Help wanted advertising-St. Louis (1967 = 100)[c]	15.63%	74	71	75	71	64	68
Retail sales (in millions)[d]	4.91%	$6,245	$6,596	$6,627	$6,135	$5,953	$6,163
Coal production (in thousands of tons)	-0.76%	4,057	4,275	5,068	4,624	4,088	4,979
Petroleum products (in thousands of barrels)[b]	-1.48%	2,000	1,990	1,980	1,985	2,030	1,980
Vendor performance[e]	9.68%	68%	70%	66%	62%	62%	57%
Building permits (in thousands)							
Residential housing units	-8.09%	4,112	4,991	4,632	4,112	4,474	5,101
Value of residential housing	1.65%	$348,018	$419,199	$384,122	$346,092	$342,356	$391,383
Value of nonresidential construction							
Industrial buildings	72.18%	$30,471	$32,728	$30,585	$16,511	$17,697	$26,543
Office, banks, and professional buildings	4.69%	$43,233	$52,488	$65,638	$28,256	$41,298	$66,837
Stores and other mercantile buildings	-0.10%	$50,288	$59,009	$47,211	$33,886	$50,338	$36,555
Other	38.55%	$11,870	$6,211	$11,589	$5,127	$8,567	$7,542
Consumer price index (1982-84 = 100)							
North Central US	3.90%	116.6	116.0	115.5	114.9	112.2	112.1
North Central/population more than 1,200,000	3.97%	117.7	117.0	116.0	115.7	113.2	113.0
North Central/population 360,000 to 1,200,000	3.87%	115.8	115.6	115.7	115.0	111.5	111.5
North Central/population 50,000 to 360,000	4.18%	116.6	116.1	116.1	115.2	111.9	111.7
North Central/population less than 50,000	2.98%	113.5	112.8	112.2	111.8	110.2	109.8
Chicago	3.41%	119.8	118.9	117.0	117.1	115.8	115.5
St. Louis	2.94%	116.0	—	114.1	—	112.7	—
		1988:1	1987:4	1987:3	1987:2	1987:1	1986:4
Personal income (in millions)[b,f,g]	6.16%	$197,330	$196,140	$189,036	$186,487	$185,885	$181,893
Per capita personal income[b,f,g]	5.86%	$16,980	$16,890	$16,290	$16,082	$16,041	$15,708

[a]Represents absolute change (percent change not relevant). [b]Recent month is preliminary figure. [c]The Conference Board, *Help Wanted Advertising*. July 1988, seasonally adjusted. [d]Latest month projected by BEBR. [e]Percentage of companies receiving slower deliveries. [f]Seasonally adjusted at annual rates. [g]Percent change between 1987:1 and 1988:1

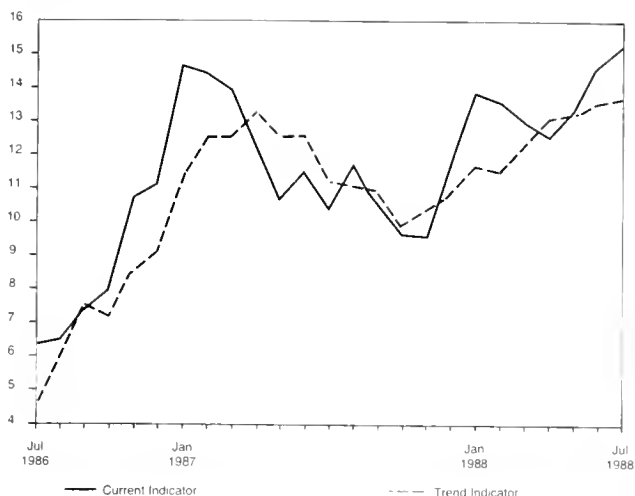**Chart 1. Composite Leading Indicators** *(average percent change in base indexes)*

Jul 1986   Jan 1987   Jan 1988   Jul 1988

——— Current Indicator   - - - Trend Indicator

Chart 2. Employment—Manufacturing *(in thousands)*

July 86   Jan 87   July 87   Jan 88   July 88

Chart 3. Help Wanted Advertising Indexes *(percent change from previous month, seasonally adjusted)*

Percent

Aug 87   Dec 87   Apr 88   July 88

——— St. Louis   - - - Chicago

Chart 4. Residential Housing Units

86 87 Aug   87 88 Jan   87 88 July

Aug 86–July 87   Aug 87–July 88

Chart 5. Year-to-Year Change in Selected CPI

Percent

Feb 88   Apr 88   July 88

North Central U S   Chicago

Chart 6. Coal Production *(in thousands of tons)*

Jan 87   June 87   Nov 87   April 88   July 88

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Illinois Business Review

Illinois Economic Outlook
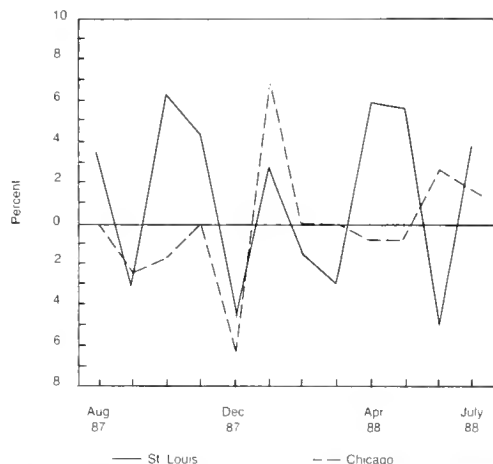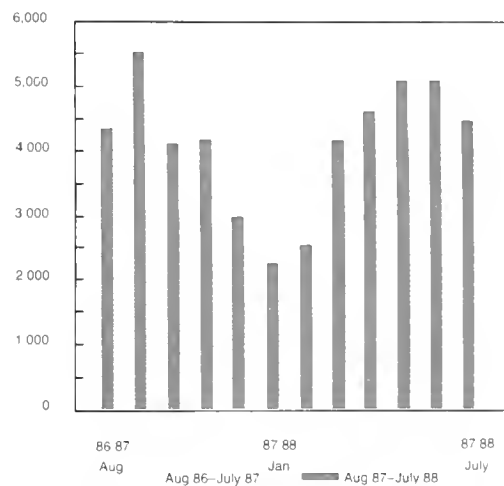
The Illinois Econometric Model predicts a slowdown in the growth in personal income. The projection generated by the model is markedly at variance with the forecast obtained from the leading indicator data (see page 14). A predicted growth of 4.8 percent in 1988 is down slightly from the 5.5 percent growth in 1987. However, the increases are almost totally offset by increases in the price level. As a consequence, the growth in real income will average about 0.7 percent in 1988, less than one-half the 1.8 percent growth in 1987. Looking ahead, the forecast for 1989 indicates that nominal income growth will not keep pace with the rising price level, resulting in a decrease in real income. A breakdown of personal income by sector is given in the table.

The chart shows the quarterly changes in nominal income for the largest sectors of the state's economy. Small increases are expected in manufacturing and wholesale and retail trade. The service sector will continue to perform better than the other sectors of the economy after recovering from a slight decline in the first quarter of 1988. Overall, the forecasted performance of the Illinois economy, as measured by personal income changes, is not encouraging.

Illinois Personal Income *(percentage change from previous quarter)*

manufacturing   wholesale/retail   finance   services
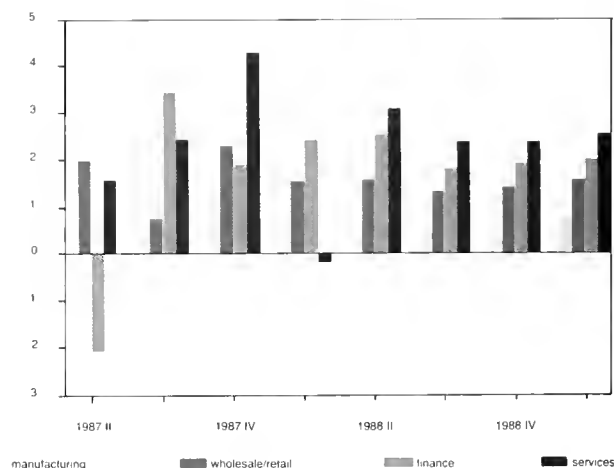
Illinois Seasonally Adjusted Personal Income *(nominal, at annual rates)*

	History				Forecast			
	1987:II	1987:III	1987:IV	1988:I	1988:II	1988:III	1988:IV	1989:I
Total personal income (in millions)	$186,487	$189,036	$196,140	$197,330	$198,828	$200,315	$202,384	$205,524
Private nonfarm	118,908	120,979	124,038	126,538	128,626	130,232	131,851	133,892
Mining	1,371	1,394	1,405	1,420	1,452	1,439	1,425	1,418
Construction	8,347	8,310	8,560	8,814	9,116	9,125	9,102	9,128
Manufacturing	28,995	29,553	29,938	31,226	31,459	31,595	31,686	31,932
Durable	17,809	18,242	18,459	19,349	19,463	19,490	19,488	19,583
Nondurable	11,186	11,311	11,479	11,877	11,995	12,105	12,199	12,348
Utilities and transportation	10,804	10,915	11,053	11,314	11,532	11,538	11,559	11,632
Wholesale and retail trade	23,694	23,869	24,422	24,806	25,203	25,546	25,915	26,341
Finance, insurance and real estate	12,395	12,824	13,068	13,389	13,731	13,981	14,254	14,546
Services	32,842	33,648	35,098	35,034	36,133	37,008	37,910	38,895

Illinois

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WILLIAM R. BRYAN

1989: More of the Same, or the Onset of Recession?

Economic activity has improved markedly in 1988, the sixth consecutive year of expansion. Evidence of improvement has been widespread, extending through markets for goods and services, markets for labor and other productive factors, and markets for credit and financial services.

Strength in sectors of the economy other than the federal government has been sufficient to overcome the restrictive effects of economic policy measures. Both monetary and fiscal developments in the past year have tended to limit economic growth. It can be argued that the monetary base has expanded more slowly than the trend. The growth in balanced-budget GNP, a summary measure of fiscal actions, has fallen substantially below trends of earlier years.

This article presents an overview of development in 1988, laying the basis for projections into 1989. The discussion follows a sequence driven by a circular logic: namely, that output leads to employment; that employment begets income; that income leads to spending; then, to complete the circle, that spending calls forth production. To the extent that production and spending on final product proceed at different rates, adjustments in inventories and prices are triggered. Of course, what we treat as a sequence is, in reality, a simultaneous process. But a presentation must begin and, happily, end somewhere.

Output

Physical output has risen rapidly in 1988. The increase in real gross national product (GNP), a measure of the dollar value of goods and services sold in markets but with prices held at levels prevailing in an arbitrary year (1982), has proceeded at just over a 4 percent annual rate. In the preceding year, real GNP expanded about 3.4 percent (Chart 1).

Chart 1. Gross National Product
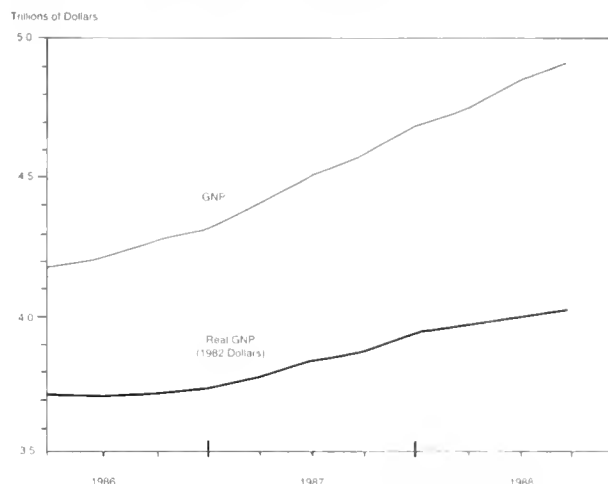
Growth during 1988 has been most pronounced in the production of additional plants, equipment, inventories, and other elements of investment. Output of consumption goods purchased by households has expanded more slowly than output in the economy as a whole, an annual rate of just 2.5 percent; the production of government goods and services along with those acquired by government have risen at a scant 1.5 percent rate.

Another measure of physical production is provided by the Federal Reserve System's Index of Industrial Production. Published monthly, the index is a measure of the output of the nation's mines, factories, and utilities. Industrial output has risen at just under a 6 percent rate in 1988, continuing the expansion beginning in early 1987.

Labor Markets and Income

The expansion in physical production has been accompanied by a growth in employment. Total employment has risen at more than a 2 percent rate in 1988, roughly in line with experience in the past two years (Chart 2). An alternative measure of the strength of labor demand is provided by payroll employment data. These statistics, which exclude agricultural employment, consist of a count of jobs at work sites. As a consequence, they can include the same person twice. Even so, the measure is responsive to changes in the demand for workers. Payroll employment has expanded at more than a 3.6 percent annual rate in 1988, up somewhat more sharply than in other years since the beginning of the economic recovery.

Chart 2. Labor Market Statistics
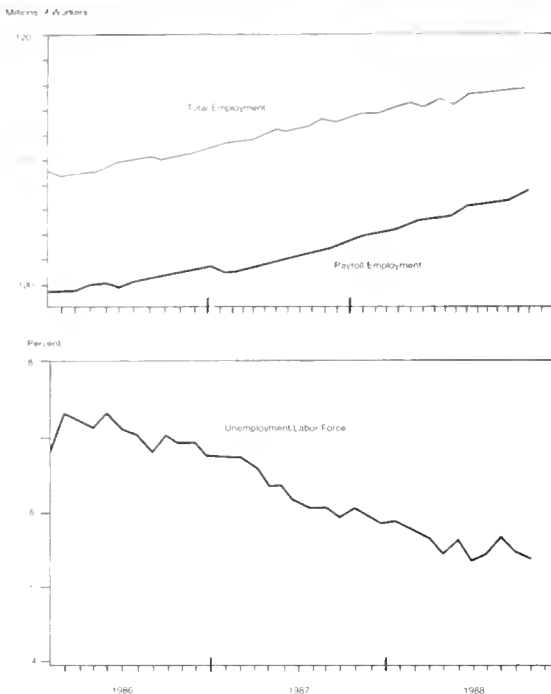
The growth in employment in 1988 has been sufficiently strong to bring about a further reduction in unemployment. During the first half of 1988 unemployment as a percent of the labor force declined more or less steadily. But after mid-year the unemployment rate has tended to stabilize.

Partly by virtue of the expansion in employment, there has been a strong increase in total income during the year. Personal income, which also includes transfer payments, has risen at a 7.5 percent rate in 1988. After-tax income has increased at just under an 8 percent rate. Speaking in rough terms, the 8 percent rise in income has exceeded the 3 percent growth in employment, implying an increase in wage rates of just under 5 percent. In fact, hourly compensation in the business sector has risen at a 4.7 percent rate in 1988.

Spending

There has been a strong increase in aggregate spending during 1988. Gross national product, a measure of spending on currently produced goods and services valued at current prices, has risen at a 7.5 percent annual rate. Within this total, consumer spending has increased at a 7 percent rate; investment spending by business has expanded at a 10 percent rate; and total government spending (federal government plus state and local government) has risen at a 4.8 percent rate.

The fact that imports exceeded exports means that the diversion of household consumption, business investment, and government spending away from domestic production exceeded foreign spending here. Hence, there was a net diversion of effective demand away from domestic producers. Such developments tend to reduce pressures for price increases. In contrast, but for some of the same reasons, a negative balance on current account vis à vis foreigners has an adverse short-term impact on domestic labor markets. As 1988 unfolded, however, exports rose markedly relative to imports. Exports had eroded to the point where they accounted for only 77 percent of imports (Chart 3).

Chart 3. International Statistics
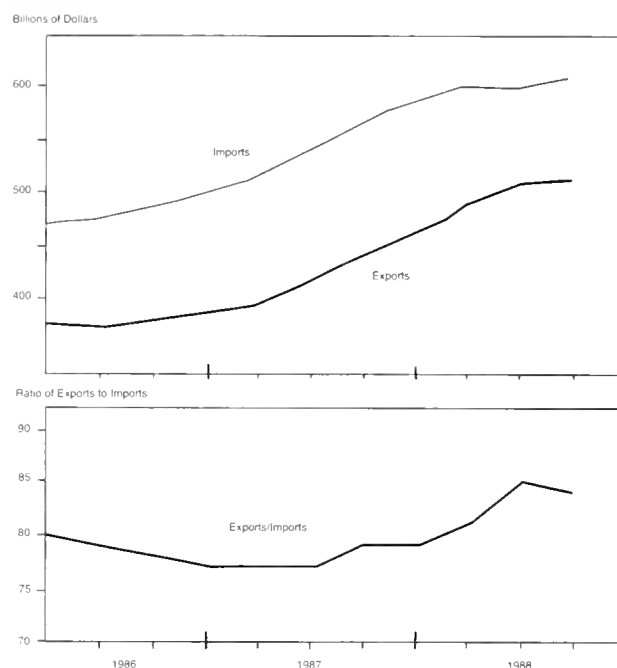
However, by late 1988 exports had expanded to 84 percent of imports. Of course, balance would be achieved if the ratio of exports to imports were one.

Other measures of spending have also shown strength, but suggest some tapering off late in the year. Retail sales, a monthly measure of sales at retail establishments, showed increases of well over 10 percent early in the year, but since late spring spending growth has slowed abruptly.

Inventories and Prices

There is a view that inventory developments play a vital causal role in the economic process. Indeed, there are those who characterize recessions and expansions in terms of dynamic shifts in business inventories. According to this view, for whatever reason, businesses may wish to expand their inventories. Such actions place other inventories under pressure. Firms experiencing inventory pressure may scramble to maintain them. From their suppliers they make increasingly frequent or expanded orders and seek earlier deliveries. If they can do so, they delay deliveries to their customers. But the upshot of these adjustments is to stimulate overall economic activity. In contrast, for one reason or another, firms may regard their inventories as excessive. Adjustments to excessive inventories involve reductions in orders from suppliers and improved deliveries. As a consequence, suppliers experience inventory increases and, in turn, may find it necessary to cut production. Such adjustments serve both to initiate and to exacerbate weakness in the economy.

Inventories have drifted lower in recent months and over the past several years. Near the end of the recession ending in late 1982, manufacturing and trade inventories reached a level that would have accommodated sales of more than one and two-thirds months. By late 1987, the inventory-to-sales ratio had fallen to 1.46, but by mid-1988 it had edged upward to a level that would satisfy sales for nearly one and one-half months (Chart 4). In short, part of the adjustment to excessive spending growth has taken the form of a downward adjustment in inventories.

Chart 4. Inventories and Sales, Manufacturing and Trade
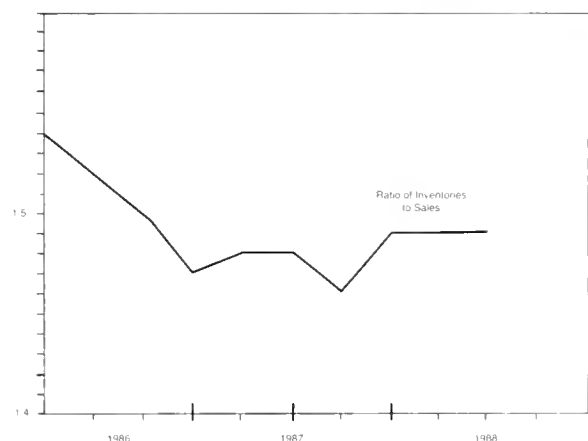
The remaining adjustments to the excess of demand over supply have taken the form of price level increases. Even so, the overall rate of inflation during 1988 has been roughly in line with experience during 1987. Consumer prices have risen at about a 4 percent annual rate in 1988, up somewhat from the 3.6 percent increase in the preceding year (Chart 5). Producer prices have risen at a 2.3 percent rate, little changed from the increase of 2.1 percent in 1987.

Chart 5. Price Level Indicators
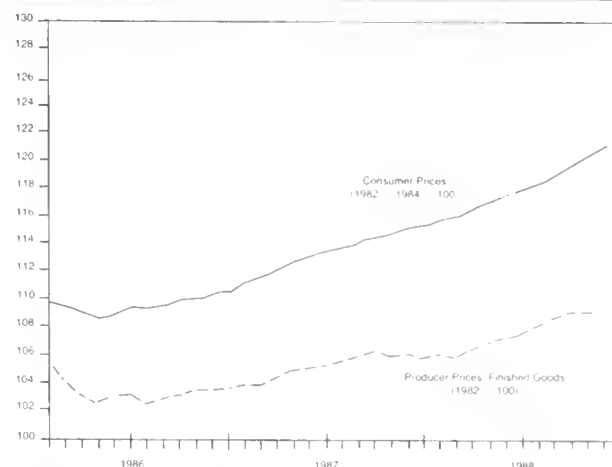
Financial Developments

By virtue of financial processes, the distribution of spending can differ from the distribution of income across the population of individuals, households, business firms, governments, and countries. During any period, no matter how short or how long, some spending units are in surplus and others are in deficit. An aspect of the economic process is that the sum of deficits is always equal to the sum of surpluses. To a major extent, that equality comes about by virtue of equilibrating shifts in income, spending, inventories, and prices. To some extent, that equality comes about in a process involving changes in interest rates.

Presumably, spending decisions such as those discussed here are influenced by the level of interest rates. Households, businesses, local governments, and others make expenditure plans for the future. As they evaluate their prospective business environment, one element of concern relates to the cost of borrowed funds. Holding constant all other factors affecting a spending decision, it is plausible to believe that high interest rates tend to limit expenditures to a greater extent than low interest rates.

Changes in interest rates are brought about by two major categories of factors. One such category exerts its influences on the public's sensitivity toward interest rates. A reduction in what is referred to here as "sensitivity," means that households, business firms, and others demonstrate an increased willingness to spend even though net lending may be reduced or net borrowing increased. As the public becomes less concerned about interest rates, upward pressure is placed on their general level. In contrast, as spending decisions become increasingly inhibited by considerations relating to the cost of borrowing funds, downward pressure is placed on interest rates. Factors leading to shifts in interest rate sensitivity encompass both institutional and cyclical considerations. Institutional changes such as liberalized debt amortization practices,

reduced down-payments, and lenient bankruptcy practices lead to reduced interest rate sensitivity. That is, they reduce the limiting impact of any given interest rate. Cyclical changes leading to reduced interest rate sensitivity include improved economic prospects, heightened inflationary expectations, tax deductions for interest expenses, an expansion in actual money balances relative to desired balances, and the like.

The second major category of factors leading to short-run shifts in interest rates relates to changes in the disparity between anticipated and actual levels of income. If businessmen, households, and others become surprised and disappointed at what is actually happening to their incomes, two things are likely to happen. Interest rates are likely to have been moving higher as the surprise was in preparation. Then, adjustments to the surprise serve to promote interest rate declines. In contrast, if businesses and households are surprised and pleased with unfolding experience, they are likely to make adjustments leading to interest rate increases.

Interest rates declined in early 1988, then moved irregularly higher through the late fall and early winter (Chart 6). Rising interest rates probably have reflected a combination of heightened inflationary expectations, happy surprises relating to ongoing developments in the economy, and an improved economic outlook.

Chart 6. Interest Rates
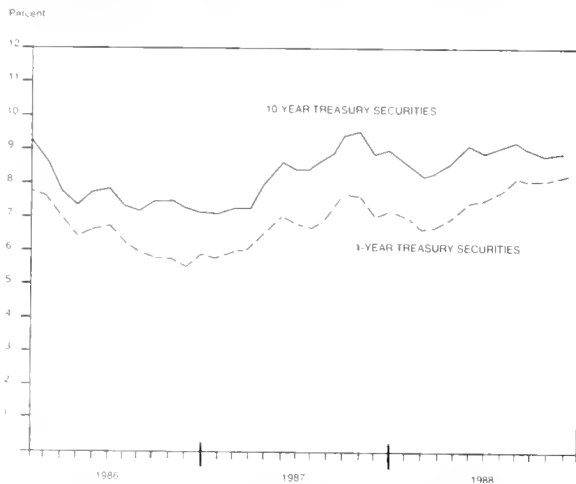
The heightened inflationary expectations can have resulted from several months of accelerated, albeit reasonably moderate, price increases. Consumer prices rose at a 5.2 percent rate in July and August; producer prices on finished consumer foods jumped upward at a 10.2 percent rate in May and June; and prices on finished goods, excluding food, rose at a 7 percent rate in September.

The vigorous growth in the economy early in 1988 was regarded as surprising. There had been a great deal of consternation and talk regarding an imminent slowdown in the US economy. Much of the concern was focused on matters that have turned out to be unimportant. Many were concerned by the fact that the economy had already expanded for five years; there was concern about the large and persistent federal deficit, along with the similarly large and equally persistent foreign deficit on current account. But as the early months of 1988 passed, the economy did not weaken; there were periods when the nation's net exports showed improvement; there were periods during which the federal deficit appeared to be narrowing; the nation's prospective presidential leadership became increasingly clarified as the year moved on. The combination of these salutary developments appears to have resulted in an improved outlook.

Working counter to these considerations, economic growth stalled in the third quarter. As indicated, income shortfalls can trigger adjustments leading to declines in interest rates.

Economic Policy

Economic policy appears to have grown increasingly restrictive in recent years. Restrictive measures are in evidence within both monetary and fiscal spheres.

It is meaningful to regard the monetary base as an instrument encompassing the essence of monetary policy. The monetary base defines the limits within which financial institutions can expand their liabilities (checking deposits, time and savings deposits, and so forth). Accordingly, the monetary base effectively limits the growth of various measures of the money supply and of loans and investments of financial institutions. Thus, the growth of the base is meaningful either in terms of its impact on the money supply or other monetary aggregates, or in terms of its impact on credit markets.

It is fairly clear that growth in the monetary base has fallen below its trend. If the trend growth in the adjusted base is related to data since 1955 (as in Chart 7), it can be argued that the shortfalls in monetary growth have lasted for about four years. If we focus on a somewhat shortened period, the shortfalls become less dramatic.

Chart 7. Monetary Base
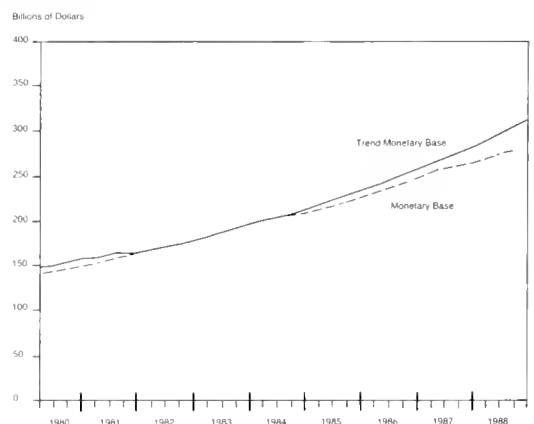
The base expanded at less than a 7 percent rate in 1988, down moderately from 9.1 percent rates of expansion in the two preceding years. In any event, whether viewed against the recent past or over an extended period, it is clear that growth in the monetary base has not been robust.

Changes in balanced-budget GNP may be viewed as summary measures of the impact of fiscal policy. The greater the increase in the level of GNP at which the federal budget would be in balance, the greater would be the change in actual GNP associated with any surge of spending by households, businesses, state and local governments, or foreigners. Some observers regard the federal deficit itself, or changes in the deficit, as a measure of the stance of fiscal policy. The problem with focusing on the actual deficit as a measure of policy is that both its level and its changes emerge from the actions of the whole economy, not just the federal government.

The growth in balanced-budget GNP has fallen well below its long-term trend in recent years (Chart 8). In the 1983–1986 period there was a downward drift in average *net* tax rate (the average tax rate less transfers); such changes serve to expand balanced budget GNP. Over the same period there was a decline in the growth in federal expenditures; such changes serve to moderate the growth in balanced-budget GNP. As it turned out, the net impact of these conflicting forces was to maintain an expansive fiscal stance. But since 1986, fiscal developments have moved toward restriction.

Chart 8. Fiscal Policy Indicators
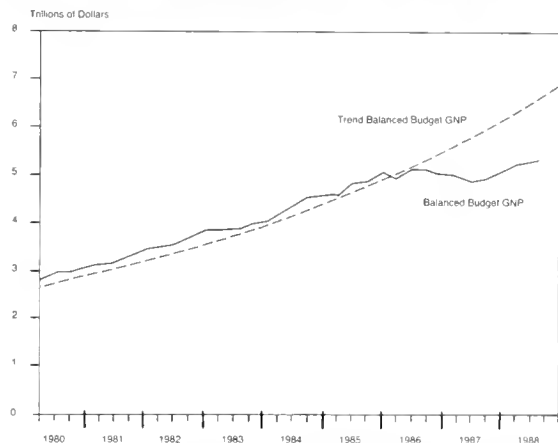
The assertion that fiscal developments are restrictive may be surprising in light of the persistent and deep federal deficits. As indicated, the actual federal deficit provides a flawed measure of fiscal policy. But even this measure hints at the restrictive fiscal situation. There has been a $68.4 billion movement towards surplus since 1986, notwithstanding a minuscule $2 billion growth in the deficit in the fiscal year just ended. The Office of Management and Budget has estimated a $30 billion movement toward surplus for the fiscal year ending in September 1989. Recall, however, that these developments and estimates depend to an important extent on the performance of those parts of the economy outside the control of the federal government.

Prospects for 1989

There is no hard evidence suggesting that the economy will weaken in the year just ahead. In the absence of such evidence, the most likely scenario for next year is that the economy will continue into its seventh consecutive year of expansion. That expansion will be marked by moderate real economic growth, further increases in employment accompanied by relative stability in the unemployment rate, a modest acceleration in the rate of inflation, and some further upward movement in interest rates. In short, I am suggesting that 1989 will provide us with more of the same; such a forecast is sometimes referred to as a naive forecast.

Even though the naive forecast remains in place, I have a growing hunch that the economy will weaken. I fear that the private and nonfederal elements of the economy will no longer be able to overcome the accumulated restrictive impact of monetary and fiscal measures. If so, the economy will weaken as a consequence of its struggle against, and adjustments to, a constrictive web of monetary and fiscal restraint.

From the perspective of those who pay attention to forecasts of this nature, it will be tough to tell the difference between these two scenarios. It is difficult to distinguish between a slowly expanding economy and one that is weakening. For one thing, by its very nature an economy moves in fits and starts; second, we can nearly always count on minor or major unexpected events (for example, the stock market collapse in 1987, the drought in summer 1988); and, third, there are delays, often important ones, in the availability of data.

Even so, it is sometimes possible to identify warning signs of a weakening economy. For example, look for erratic movements in economic statistics. If the economy is weakening, frequently released data such as retail sales, industrial production, or employment often begin to show abrupt, single-month, downward movements in current releases, or downward revisions in data released earlier. But the movements do not persist, changes in trends are not readily identifiable. The principle difference between developments consistent with the naive forecast and those betraying weakness is that interest rates will fall like a rock if the economy weakens. Here again, however, the decline will not be unambiguous. The rock will bounce upward from time to time.

I have often said that I would prefer to be precisely wrong, rather than vaguely correct. Unfortunately, a well-honed prediction at this juncture has not been forthcoming, nor is it appropriate to the underlying set of facts.

A. JAMES HEINS

State and Local Taxes and Economic Growth in Illinois

The purpose of this article is to establish a perspective on the issue of the impact of taxes on economic growth. There has been a lot of controversy on this subject over the years, ranging from the view that taxes have virtually no impact on growth to the view that any tax increase would drive business out of the levying jurisdiction. My task here is not to resolve this controversy, but simply to lay out its dimensions in a manner that facilitates intelligent discussion of the issues involved.

Let me begin by dividing the larger tax issue into three separate issues. First, there is the question of the "total tax burden." How many dollars and what percent of our personal income in Illinois are taxed by state and local governments to pay for the variety of public services offered? A second issue surrounds the distribution of this total burden among the various classes of citizens, business or nonbusiness, rich or poor. This is the "tax structure" issue. The third is the "tax efficiency" issue. Can we tie the tax burden of any group, say business, to the benefits that group gets from the government services provided out of the taxes paid?

Total Tax Burden

The most recent complete figures available (1986) show Illinois, state and local governments combined, to have raised taxes averaging $1,546 per person for a total of about $17.9 billion. That $1,546 put Illinois in 17th place among the 50 states. If we relate the $1,546 to the income of the average Illinoisan (about $15,187 in fiscal 1986), the Illinois tax burden can be stated as being 10.2 percent of income. By this measure—since Illinois incomes are high—Illinois ranked about 32nd among the 50 states. (This ranking is subject to revisions in personal income estimates.) It is this combination of figures that leads many economists to say that Illinois is an average tax state, not high, not low. The tax burden in Illinois has fallen slightly in the past ten years, relative to other states. In 1976, Illinois ranked 14th and 31st by the same measures respectively.

Having provided these facts, the question is: how does a state's ranking in "total tax burden" affect its economic growth? Simple economic common sense tells us that it depends on how government spends the tax dollars. If taxes were raised, Illinois would move up

in the total tax burden rankings. But, if those dollars were used to pay for a *successful* program of educational reform, manpower retraining, and refurbishment of infrastructure supportive of business, the economy of Illinois might actually grow faster. That is why theory and common sense tells us that economic growth cannot simply be tied to the total tax burden.

This apparently conflicts with a variety of studies that purport to show that states with increasing total tax burdens have experienced slower rates of economic growth. Indeed, I have numbers that relate growth and tax change between 1967 and 1986 that show these same results. It turns out also to be true that economic growth is less clearly related to "levels" of taxation than it is to "increases" in taxes.

Regardless, some explanation is required to put the theory in line with apparent experience. First, we might have reverse causation in the face of political inflexibilities. Economic slowdown requires greater relative spending to support social programs, given fixed requirements. Put thus, lagging growth causes increased government. Here, the problem could be attributed to political inflexibilities that might well exacerbate problems with lagging growth.

It could be true that states that increase taxes too rapidly have difficulty spending it wisely. As an economist, I tend to be repelled by the notion that the political wherewithal would be there to finance foolishness. On the other hand, I also see with the eyes of a citizen who finds the idea crudely attractive.

In any event, it is clear that our emphasis should be on government programs as well as total tax dollars. We must fight for the reform of poor programs, like elementary and secondary education in Illinois and medical care delivery, because then any savings of taxes would be good for our economy. Similarly, we might well fight for good programs—like better roads and meritorious education—even though taxes would be higher as a result.

Tax Structure

Another interesting tax question involves the structure of taxes that are used to allocate costs of government among the people of Illinois. On this issue there is wider divergence of opinion among economists, and a subdivision of the issues would be helpful.

Rich and Poor

Here, the issue is how much does the tax burden increase as people get richer? Illinois is widely believed to have a proportional tax system, that is, one featuring a flat-rate income tax, a fairly broad sales tax, and a uniform property tax (outside of Chicago). This compares with states like New York, Wisconsin, Minnesota, and California that feature highly progressive income taxes. People who have lived in Wisconsin know how burdensome their income tax can be when family income is over $50,000.

Again, the question is: what effect does tax "progression" have on economic growth in a state? And, again the common sense of economics leaves us without the dignity of a decent answer. Since we live in a democratic society, the people's "will" is roughly reflected in the tax structure, and the people's will may differ from state to state. If the tax structure were to be "too" progressive and drive the rich away, presumably the "people" would change the law. In other words, our federal structure permits states to have taxes different in structure without necessarily experiencing differences in economic growth.

This common sense is also borne out (at least roughly) by the numbers. Most studies, including my work, do not show states with progressive tax structures to have suffered relative to other states. By general agreement, Wisconsin and Minnesota—states with progressive taxes—have both done better than Illinois, which has essentially a proportional tax structure.

Having said this, I think there is a spreading belief, not readily demonstrable, that progression hurts growth. Wisconsin has reduced its high marginal income tax rates, and other states have too. Illinois has little to do here since its income tax has a flat rate of 2.5 percent, and few have expressed the concern that Illinois' lack of tax progressivity has harmed growth.

Business and Nonbusiness

Here the issue involves the proportion of taxes collected from business relative to taxes collected directly from individuals. Of course, in the end people actually pay the taxes, even though business firms write out the checks to government; business has to get the money from people to cover those checks. So, the issue could be restated in terms of the percentage of taxes collected indirectly from the people through business taxation relative to taxes collected directly from people through individual taxation.

The latest figures we have (1980) show Illinois to have collected 33.9 percent of its taxes from business, compared to a national average of 31.4 percent. Illinois has the highest percentage in the midwest. Perhaps more significant than the rate of business taxation in Illinois is the increase in this rate over the last 20 years. In 1957, Illinois was eight percent below the national average; in 1980 Illinois' business tax ratio was eight percent above the average. My earlier work on economic growth in Illinois suggests that this change in tax policy relative to the nation might have harmed economic growth in Illinois.

Here the theory that business taxes—indirect taxes on people—might harm growth has some foundation. Perhaps the most important reason is that little is known about the real impact that indirect business taxes have on people. Hence, people in a state may misperceive their tax bill to the extent that they rely more heavily on business taxation.

In some cases, states can export their tax burden to people in other states through taxes on special advantages held by business firms in the exporting states. Severance taxes on oil and coal are cases in point.

While Illinois would seem not to try to export any of its tax burden—we have no severance taxes—a close look at Chicago's local property tax suggests otherwise. Chicago practices classified assessment; business property is assessed at 40 percent of market, residential at 16 percent of market. This practice has contributed to Illinois' position of leading the nation (save South Carolina where the property tax is not really important) in the percentage of taxable property owned by industrial firms, and therefore, presumably in the percentage of property taxes paid by industry. Illinois is also second only to New York in the percentage of taxable property held by industrial and commercial firms combined.

I think the reason for this situation lies in the ability Chicago had to export its property taxes in distant years gone by. Its unique location in the center of the world's richest market area with an unrivaled transportation system enabled Chicago to attract business even as the city was socking it to them with high property taxes. Business was willing to pay to locate in this privileged city.

But now that privilege has been eroded, and Chicago is not so special anymore. The interstate highway system, among other things, has taken away some of the locational advantage that allowed Chicago to export its taxes. Business is less willing to locate there in the face of high property and other taxes. Of course, Chicago has a variety of other visible problems that have contributed to its decline.

It is clear that Chicago has to face up to major reform in its property tax. But, that reform will be difficult, to say the least. After all, can you imagine the city council lowering the assessment ratio of business and increasing taxes on houses by 50 percent to make up the difference? More likely, Chicago will work on this through a practice of abating property taxes to new and expanding firms. This is not a wholly desirable solution since it offers nothing to current business that drives the city. But politics may require this ad hoc policy rather than the preferred policy of across-the-board tax reform.

Tax Efficiency

Taxes are most efficient when they are levied against recipients of the benefits of government programs financed by the taxes. This notion is a well-received doctrine in economics, and it is just good common sense. And, it follows that efficient taxation—efficient use of our resources—can only stimulate economic growth.

Unfortunately, we have not progressed very far in designing tax systems that do an effective job of putting the cost of government on beneficiaries. At the national level this connection can be blurred with less difficulty, because while humanity requires some social safety net, and the direct beneficiaries of government cannot pay the cost, taxpayers are not apt to migrate. While states must also be in the safety net business, greater care must be exercised. When costs get out of line, and taxes are levied indiscriminately on people or business with little stake in that safety net, the economy of the

offending state will suffer because people can and will migrate to other states, taking their capital with them.

Road taxes and fees are cases where the costs and benefits of government are tolerably well related. And, studies (mine included) show that financing roads with taxes on road users contributes to economic growth. And, when states with poor highways—like Illinois's have been—spend more for highways, even though taxes are raised to pay the costs, the economy may well benefit because costs are mainly borne by beneficiaries of the improvements.

But that is where tax efficiency pretty much ends. Taxes that pay for education, especially broad-based state taxes, have little relationship to the benefits of education. So too for medical care for the disadvantaged. I do not suggest the sick and poor pay their hospital bills; that is impossible. Of course, we might do a better job of sorting out the really poor and paying only their bills.

I have long advocated a program of levying state taxes on income much like the "levy" system used by local government. Under this system, states would not get added tax revenues simply because their economies grow. State legislators, just as members of city councils do, would have to enact a tax levy every year, instead of just sitting on their hands. I believe this would improve the efficiency of our tax structure and the accountability of our politicians.

Summary

My purpose here has been to help organize discussion of the issues surrounding the impact of taxes on economic growth. I think it is useful to distinguish between the "total tax burden" and "structure" of the tax system that generates the money. It is possible to do economic harm with an average total tax burden if the tax structure is out of tune with the wishes of not only the electorate, but those they would invite to immigrate from other states and countries.

Contentiousness over proposed increases in state taxes in the last two legislative sessions has featured arguments about the total tax burden. Opponents have contended that an increase in state taxes could harm economic growth in Illinois. Proponents have mainly urged that, since Illinois is not a high tax state already, even a tax increase of 15 to 20 percent would not harm growth. Proponents would do better to drop that line and focus on the merits of the public functions financed should a tax increase be proposed again in 1989.

In the end, the efficiency issue dominates. If a majority of the electorate comes to believe that it will receive benefits from government in excess of any increased dollars paid in, a tax increase can pass the legislature. On the other hand, if people widely believe that the benefits come up short, or that money can be freed up from areas of the budget where overspending already occurs, the outlook for higher taxes is bleak.

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JOHN F. DUE

Some Questionable Provisions of the 1986 United States Tax Reform

The 1986 tax reform legislation brought major improvements to the United States federal income tax structure, particularly in greatly reducing the ease of creating tax shelters. But the changes are by no means generally acceptable. It is the purpose of this article to call attention to various features relating to the individual income tax that diverge from generally accepted standards of federal tax legislation and that are either already or certain to become controversial. It is not the intent to discuss the major, well-known issues, such as the effects of the elimination of the investment credit, curtailment of IRAs, continued double taxation of dividend income, sharp reduction in rate progressivity, or the tax rate on capital gains. Changes made by the technical and miscellaneous Revenue Act of 1988 with regard to the issues discussed are noted.

Phase Out of Exemption

The system for phasing out the personal exemptions and the lower rate for persons in the higher income groups is, as labeled by Joseph Pechman, "bizarre." The effect is to create four tax rates instead of the promised two, thought this is concealed, with a marginal rate of 33 percent for persons in the income range in which the two items are being phased out, compared to the 28 percent marginal rate affecting other persons above the level at which the lower rate ends. Not only is this an unnecessary source of confusion, but it is contrary to the objective of holding marginal rates down for incentive reasons. There are other simpler ways of accomplishing the same objective.

Capital Gains and Losses by Mutual Funds

Net capital gains realized by mutual funds are taxable to the holders of the funds even though, unlike other capital gains, the holders have no control over the timing of the gains, whereas net capital losses made by mutual funds cannot be transmitted to the holders. The situation was particularly bad for 1987; some of the funds made large gains prior to the October fall in stock prices. These were taxable to the holders of the funds, as of the record date, even though the shares had fallen in sales value after the stock market fall. Even some stockholders who had acquired the mutual funds after the fall were taxed on gains from which they had not benefitted. The provision that requires the funds to distribute 98 percent of the realized capital gains aggravates the problem.

Payment of Annuities

In 1986 Congress altered the treatment of payouts from various retirement systems retroactively. Prior to the legislation, amounts paid out during the first three years following retirement were not taxed if they did not exceed the previous contributions, on the grounds that these amounts were merely return of sums already paid in by the employee. But the 1986 legislation changed this, to allow exclusion beginning the first year of only a portion of the annuity, based on life expectancy, for persons retiring after 1 July 1986. Thus, many persons found themselves confronted in December 1986 with thousands of dollars of unexpected income taxable for 1986. Regardless of the merits of the change, it was unconscionable for Congress to make this retroactive to July 1986.

Income Averaging

The 1986 act eliminated the income averaging provision. One of the long-standing defects of the income tax had been its discrimination against persons with fluctuating incomes; only in the last decade did the law provide a limited but reasonable approach. Eliminating this restores the earlier inequity against such persons, less severe because of the lower rate progression, but nevertheless significant.

Authors

The 1986 Act introduced changes in tax treatment of authors that can most appropriately be described as idiotic. Under the 1986 legislation, expenses involved in writing a book would not be deductible in the period in which they were incurred but had to be capitalized and deducted on a depreciation basis against the subsequent royalty income. A writer could not lump his writing together and deduct expenses made currently against income from other writing, but could deduct them only from the income from the specific book. This would involve a tremendous amount of nuisance activity for writers of books that yield relatively little income, and potentially serious liquidity problems for authors having heavy outlay during writing. The rule that even postage charges must be capitalized violated all the usual rules relating to expensing. But the main objection is the silly nuisance created. This provision was eliminated by the 1988 Act for freelance authors, photographers, and artists.

Capitalization and Inclusion in Inventory Costs

Major problems have been created by the requirements for capitalization and inclusion in inventory costs of various expenses of manufacturers previously deductible on a current basis.

Scholarships

Another change that may have merit in principle but not in implementation relates to scholarships. As the *Wall Street Journal* recently commented, a student going to college on a scholarship needs to be accompanied by a cost accountant. The rule of the previous law that scholarships were not taxable, while consonant with the rule that gifts received are not income, did result in some inequity and unnecessary leakage of revenue, since students were responsible for tax on income for which they worked but not for that received on a scholarship or fellowship. To make all scholarship income taxable would have sabotaged the intent of scholarship programs and made it necessary to tax all tuition waivers—taxing a sum that the person did not receive and could not receive in money. Thus, only the portion of scholarships that cover tuition, fees, and books was left exempt; any amounts above this are taxable, and the total must be segregated. But some schools give lump sum scholarships that cover tuition, fees, board and room, that is, without the segregation that must be done for tax purposes. While many students will, in fact, pay little or no tax because their total incomes are too low, others, who are able to attend college only because of scholarships that cover living expenses to supplement outside taxable income will be squeezed financially. The whole effort is petty—scrambling for a relatively few dollars of revenue—and contrary to the principle that gifts are not taxable. A much simpler approach would have been to allow exclusion of scholarships only up to a specified maximum per year—if they are to be taxable at all.

Changes were also made with regard to employer-provided educational benefits. These were made taxable to the recipient by the 1986 legislation. This provision was repealed by the 1988 act, effective through 1990, but only for assistance provided for undergraduate, not graduate, education, and the total was limited to $1,500. Also in the 1986 legislation, tuition waivers provided by educational institutions to graduate students were made taxable if they were a portion of the payment for work, as for example, as a teaching assistant. The 1988 act, however, repealed this provision; tuition and fee waivers provided by universities to research and teaching assistants are again excluded from taxable income, but those provided to graduate students who are not assistants are still taxable, an absurd rule. These 1988 changes eliminated some of the worst features in this area of the 1986 act, but anomalies remain.

Two-Earner Families

The elimination of the special deduction for two-earner families restores the marriage penalty, despite the reduced progression in rates. There appears to be no optimal solution to the relative treatment of different family arrangements—single, married couple with one salary earned, one with two persons earning comparable amounts. But the inequity is aggravated by ending the two-earner credit.

Unreimbursed Employee and Investment Expenses

The restriction on unreimbursed employee and various investment expenditures to amounts in excess of 2 percent of adjusted gross income is not logical. Either these are expenses of earning the income and, thus, should be fully deductible without regard to a 2 percent figure, or they are not appropriately regarded as expenses of earning the income and should not be deductible at all. It makes no sense to restrict them as has been done, thus taxing persons on amounts that are not net income. By contrast, a 2 percent rule on contributions would make a great deal of sense; there is no need, either in terms of equity or encouraging contributions, to allow deduction of small amounts.

The Additional Standard Deduction for the Elderly and the Blind

The additional personal exemption for persons over 65 and for the blind was eliminated and replaced by an additional standard deduction of $750 for a single person, $600 for a married person, and the same figure for a qualifying spouse but not dependents. But no equivalent deduction is available for a person who itemizes. This rule makes little sense. The elderly and/or the blind may have substantial medical or other deductible items that make itemization desirable—yet doing so causes them to lose any additional standard deduction.

Complexities

All in all, the tasks of the taxpayer, and thus of the IRS, have been made more difficult by many changes. Reducing the number of rates does not simplify the operation. While a few changes have lessened the compliance tasks, such as elimination of the deductibility of sales taxes, many have aggravated it. The limitation of the interest deduction to those on home mortgages is a source of serious complications and interpretative problems—so serious that change in the provision is imperative. Quite apart from complications, the restrictions will result in substantial change in forms of borrowing, as borrowing for nonhome purposes takes the form of real estate mortgages.

The reporting by stock and real estate brokers of gross proceeds from sales of assets adds materially to the tasks of many taxpayers, and the complex handling on form 1040 of capital gains distributions is seriously confusing. The new rule relating to income of children, although justifiable, adds to complexity for many taxpayers; this rule was simplified somewhat by the 1988 legislation, which makes it unnecessary for children under 14 to file returns if the income is between $500 and $5,000, and solely from interest or dividends; the income is included in the parent's income.

Some Policy Issues

Serious questions can be raised about one policy issue: the elimination of the deduction for state sales taxes. If no other taxes were deductible, it would make little sense to allow deductibility of sales taxes. But with income and property taxes deductible, the nondeductibility of sales taxes involves drastic

interference by the federal government with state-local tax structures. Whether the states are likely to shift from sales to income taxes to any degree is doubtful, but such change is encouraged. To the extent that it occurs, one of the chief objectives of the 1986 reform will, in part, be sabotaged—because state marginal income tax rates will be higher.

One peculiarity is the continued deductibility of taxes on personal property. In some states, such as Indiana, most of the annual registration charge for motor vehicles is designated as personal property tax and is deductible, whereas in other states in which the overall charge is comparable but all is designated as motor vehicle registration fee, nothing is deductible. In general, all major state-local general taxes should be deductible or none of them; the present treatment is very difficult to defend.

A few more general policy issues warrant mention. The continued use—and strengthening—of the alternative minimum tax demonstrates the inadequacy of the overall reform; if the basic tax were satisfactory and all shelters eliminated, no minimum tax system would be required. There are major aspects of the tax that are very difficult to justify under any rational policy: deductibility of interest on a second home, failure to tax capital gains realized at death, the continued very lenient treatment of homeowners compared to tenants, and the various features that give rise to liability under the alternative minimum tax but not the regular tax. But one serious deficiency in the opposite direction remains: the failure to index capital gains, with resultant taxation of gains that are not truly income.

In general, the tax reform involved a number of penny-grabbing actions, while leaving major avenues of escape untouched. Much as it accomplished, the tax reform contains many aspects that can be questioned—provisions that will lead to increasing pressure to make further changes, some already made in the 1988 Act. Once Pandora's box is opened, some of the major desirable features of the change may be lost. But failure to make some changes is intolerable.

Summary

While the legislation of 1986 improved the tax structure in many ways, it created or perpetuated a number of anomalies and features that violate accepted standards of income taxation. These can be avoided by following several criteria:

- Complex provisions should be avoided when simpler methods will serve. Violations of this rule include the system for phasing out the personal exemptions and initial bracket rate as income rises above specified levels; the treatment of scholarships, and others.
- Capital losses should receive the same general treatment as capital gains—which they do not with mutual fund holders.
- Items that are not income by usual standards should not be taxed: Certain mutual-fund-holder capital gains, gifts such as scholarships, amounts that cover unreimbursed employee and investor expenses.
- Tax changes involving significant amounts of tax should never be made retroactive, in the interests of rational financial planning and taxpayer morale.
- The tax should not discriminate against certain forms of income: irregular incomes; those of families involving different patterns of receipt of income, for example.
- The tax should not distort selection of tax structures by the states and local governments; the chief violation is the nondeductibility of sales taxes while income and property taxes are deductible.

Illinois Business Indexes

No foreseeable economic contraction is likely to develop over the next two quarters in the state of Illinois according to leading economic indicators. As Chart 1 shows, both the current and trend indicators have increased throughout most of 1988. Moreover, the current indicator remained above the trend indicator during virtually all of 1988 and part of 1987. The isolated one-month drop in the indexes during September provides insufficient evidence to predict a downturn in economic growth during the next few quarters.

Growth in the Illinois economy is also reflected in the general uptrend in manufacturing employment in the northwestern region and the greater Chicago area (Chart 2). At the same time, retail sales continue to show a strong growth compared to the same period in 1987.

Personal income in Illinois has grown in the past four years, registering marked improvement over experience during the 1980–1982 period (Chart 3). As it is clear from the chart, Illinois trails the nation in personal income growth.

State unemployment has remained above the national average during the past few years, but the seasonally adjusted monthly unemployment rates for Illinois, shown in Chart 4, keep showing a healthy trend.

The national and Chicago help wanted indexes measure the volume of classified advertising in major newspapers throughout the country and the Chicago area, respectively. These indexes also show great sensitivity to changes in the demand for labor. In September, Chart 5 indicates that Chicago and the US are following the same general constant trend. But during the same month, the Chicago index has suffered a 5.98 percent drop compared with the same period in 1987, while the St. Louis index keeps growing at a moderate pace.

Finally, inflationary pressures continue to emerge in the US and Illinois economies. Chart 6 shows that inflation, measured through the Consumer Price Index, has been increasing for the past few months while the Illinois average remains above the national rate.

ILLINOIS BUSINESS INDEXES

	Percent change Sept. 1987-Sept. 1988	Sept. 1988	August 1988	July 1988	June 1988	May 1988	Sept. 1987	August 1987
Leading Indicator (Current Indicator)	1.95[a]	12	15	15	14	13	10	12
Leading Indicator (Trend Indicator)	2.52[a]	13	14	14	14	13	11	11
Employment-manufacturing (in thousands)[b]	1.69	950	950	947	950	944	934	933
Average weekly hours-manufacturing[b]	0.00	42	42	42	42	42	42	42
Weekly earnings-manufacturing[b]	2.21	$461.34	$460.65	$462.18	$464.67	$460.10	$451.36	$453.44
Help wanted advertising-Chicago (1967 = 100)[c]	−5.98	110	117	119	117	114	117	120
Help wanted advertising-St. Louis (1967 = 100)[c]	6.25	68	64	74	71	75	64	66
Retail sales (in millions)[d]	13.40	$6,550	$6,282	$6,245	$6,596	$6,627	$5,776	$5,958
Coal production (in thousands of tons)	−7.98	5,100	5,090	4,057	4,275	5,068	5,542	5,226
Petroleum products (in thousands of barrels)[b]	6.67	2,000	2,050	2,000	1,990	1,980	1,875	1,810
Vendor performance[e]	−7.25	64%	68%	68%	70%	66%	69%	60%
Building permits (in thousands)								
Residential housing units	42.68	4,373	4,246	4,112	4,991	4,632	3,065	4,616
Value of residential housing	9.29	$361,047	$355,085	$348,018	$419,199	$384,122	$330,352	$318,192
Value of nonresidential construction								
Industrial buildings	−14.19	$27,897	$33,406	$30,471	$32,728	$30,585	$32,512	$30,566
Office, banks, and professional buildings	4.68	$71,098	$24,292	$43,233	$52,488	$65,638	$67,922	$33,539
Stores and other mercantile buildings	22.37	$62,600	$37,820	$50,288	$59,009	$47,211	$51,157	$34,784
Other	4.50	$4,728	$9,415	$11,870	$6,211	$11,589	$4,524	$8,677
Consumer price index (1982–84 = 100)								
North Central US	3.19	117.2	117.7	116.6	116.0	115.5	113.6	113.1
North Central/population more than 1,200,000	3.85	119.0	118.3	117.7	117.0	116.0	114.6	114.0
North Central/population 360,000 to 1,200,000	3.68	117.0	116.5	115.8	115.6	115.7	112.9	112.6
North Central/population 50,000 to 360,000	3.39	117.4	117.2	116.6	116.1	116.1	113.6	112.8
North Central/population less than 50,000	3.62	114.2	113.9	113.5	112.8	112.2	110.2	110.5
Chicago	4.17	122.0	120.1	119.8	118.9	117.0	117.1	116.7
St. Louis	2.62	117.3	—	116.0	—	114.1	114.3	—

		1988 II	1988 I	1987 IV	1987 III	1987 II		
Personal income (in millions)[b][f][g]	8.04	$201,474	$199,339	$196,140	$189,036	$186,487		
Per capita personal income[b][f][g]	5.87	$17,026	$16,980	$16,890	$16,290	$16,082		

[a]Represents absolute change (percent change not relevant). [b]Recent month is preliminary figure. [c]The Conference Board, *Help Wanted Advertising*, September 1988. [d]Latest month projected by BEBR. [e]Percentage of companies receiving slower deliveries. [f]Seasonally adjusted at annual rates. [g]Percent change between 1987 II and 1988 II.

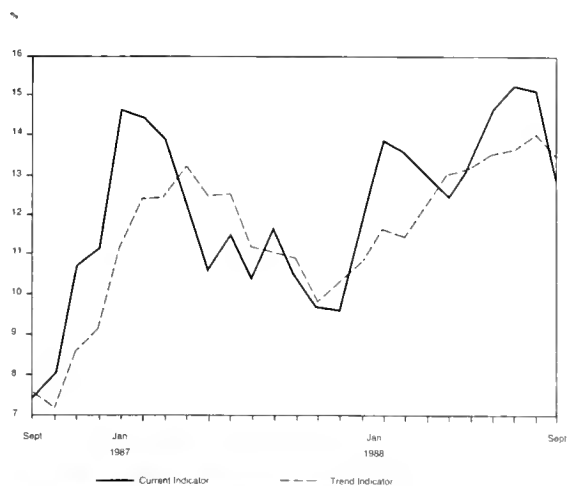**Chart 1. Composite Leading Indicators** *(average percent change in base indexes)*

Current Indicator — — Trend Indicator
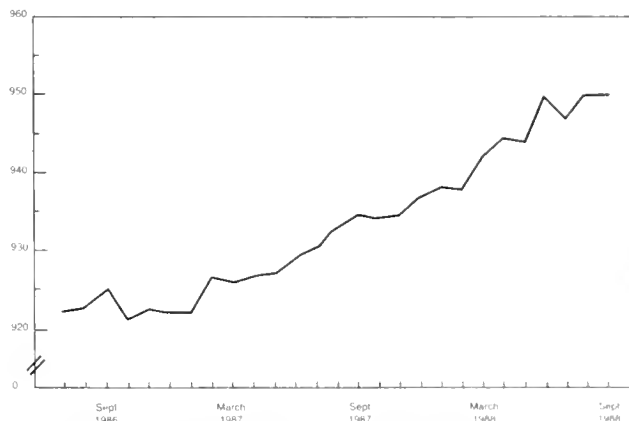
Chart 2. Employment - Manufacturing *(in thousands)*

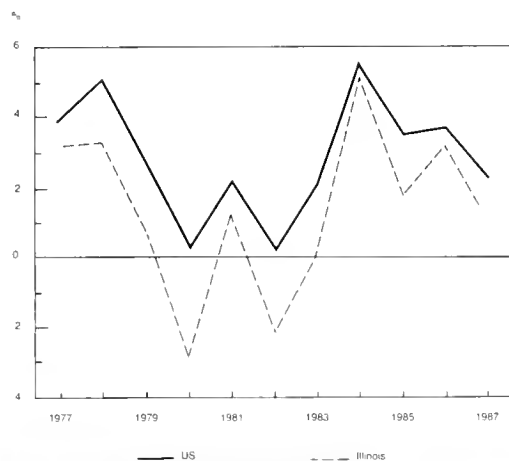**Chart 3. Illinois Total Personal Income** *(comparative percent change with the US economy, in constant 1982 dollars)*

US — — Illinois
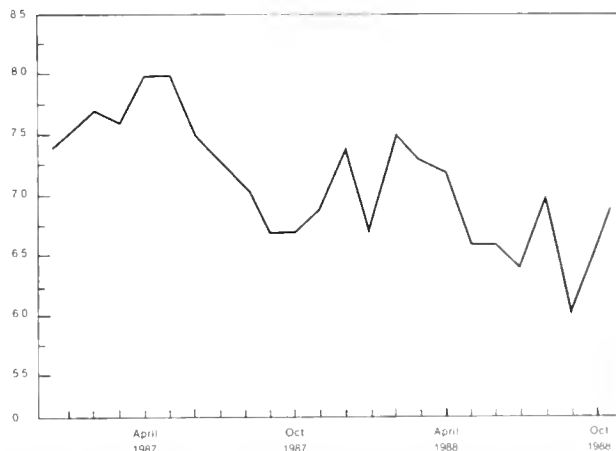
Chart 4. Illinois Unemployment Rates *(seasonally adjusted)*

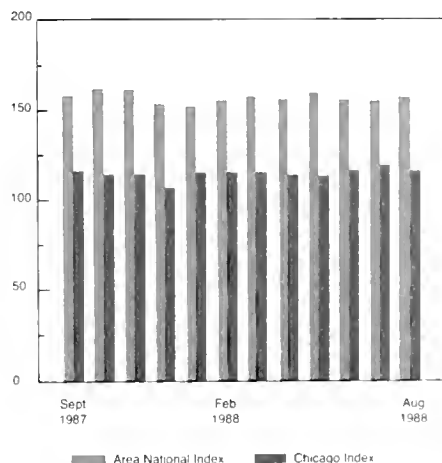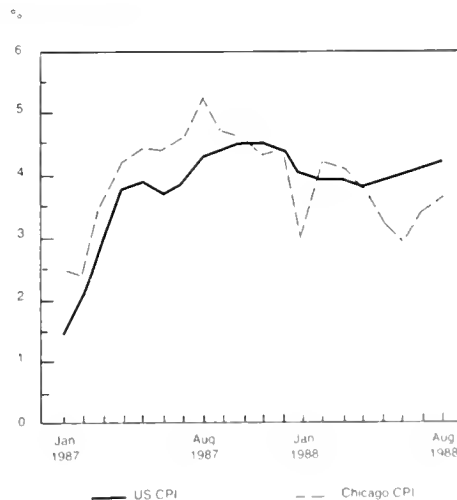**Chart 5. Help Wanted Advertising Indexes** *(seasonally adjusted, 1967 = 100)*

Area National Index   Chicago Index

Chart 6. Year-to-Year Change in Selected CPI

US CPI — — Chicago CPI

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Illinois Business Review

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Illinois Economic Outlook

Employment growth in Illinois is expected to be modest for most of 1989. While growth is anticipated in services and trade, both wholesale and retail, declines are likely to occur in manufacturing employment. This is similar to the changes in employment at the national level.

After increasing in the early part of 1989, employment in US manufacturing is predicted to decline over the next several quarters. Other sectors, such as finance and services, are expected to show employment increases. US employment is projected to increase by about 2 percent in 1989, but slower growth is forecast for Illinois.

The chart shows quarterly changes in Illinois employment for the largest sectors of the economy. The chief impression emerging from an inspection of the chart is that there is a marked divergence in growth rates. Declines in manufacturing employment are offset by growth in other sectors.

Chart. Illinois Employment *(percentage change from previous quarter)*
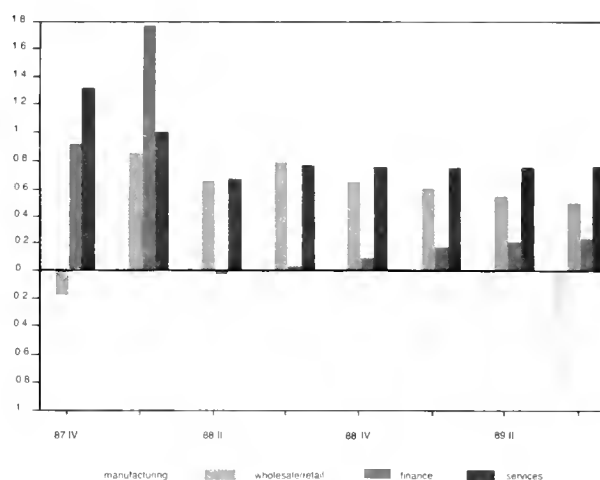
Illinois Seasonally Adjusted Employment

	History				Forecast			
	87:IV	88:I	88:II	88:III	88:IV	89:I	89:II	89:III
Total private nonfarm (thousands)	4,128.4	4,187.9	4,212.3	4,193.3	4,276.7	4,283.6	4,284.2	4,285.4
Mining	24.0	24.1	24.0	23.5	23.0	22.5	22.0	21.7
Construction	187.0	202.7	206.5	202.3	196.2	190.2	185.1	180.9
Manufacturing	936.1	941.9	945.5	944.2	939.4	934.1	927.2	919.1
Durables	569.4	571.8	574.8	574.3	570.2	565.8	560.5	554.2
Primary metals	55.6	54.6	54.8	56.7	57.0	57.8	58.3	58.8
Fabricated metals	110.9	108.7	108.8	109.8	110.5	110.5	109.9	109.0
Nonelectrical machinery	139.5	137.8	138.7	140.0	140.1	139.9	138.9	137.6
Electrical machinery	120.2	121.9	122.5	120.0	116.5	114.1	112.1	109.8
Miscellaneous durables	143.1	149.1	150.1	147.7	146.0	143.6	141.3	138.9
Nondurables	367.5	369.7	370.4	369.9	369.2	368.3	366.7	364.9
Food products	91.4	91.2	91.1	90.7	90.9	91.1	90.6	90.1
Printing and publishing	107.1	108.9	109.6	109.5	109.3	109.1	108.8	108.4
Chemicals	57.4	57.8	58.1	58.5	58.8	59.1	59.2	59.1
Miscellaneous nondurables	110.1	111.4	112.1	111.2	110.2	109.1	108.2	107.3
Utilities and transportation	291.4	300.8	301.7	295.5	290.0	285.6	282.0	279.1
Wholesale and retail trade	1,234.2	1,244.8	1,253.0	1,263.0	1,271.2	1,278.8	1,285.9	1,292.3
Finance, insurance, and real estate	357.4	363.8	363.6	363.7	364.0	364.6	365.4	366.3
Services	1,162.7	1,174.5	1,182.4	1,191.4	1,200.4	1,209.6	1,218.8	1,228.1

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